The Real Effects of Opacity: Evidence from Tax Avoidance

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ABSTRACT

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This study provides evidence on a significant real consequence of an opaque financial reporting information environment: increased corporate tax avoidance. Using an international sample of firms, I find that firms with a more opaque information environment, as measured at both the firm and country level, exhibit higher levels of firm-specific tax avoidance. More importantly, additional tests using the adoption of International Financial Reporting Standards (IFRS) as an exogenous shock to the information environment while simultaneously controlling for tax regime changes around the date of IFRS adoption provide direct evidence on the direction of the association, namely that opacity causes tax avoidance. Similarly, the results from tests using the initial enforcement of insider trading laws provide additional support for a directional hypothesis. In support of the firm-level findings, I also find evidence in the aggregate that opacity is associated with countries collecting less corporate tax revenues as a percentage of gross domestic product. In whole, these findings suggest that tax avoidance is a significant real effect of opacity with implications for practitioners, regulators, researchers, and tax-enforcement agencies.

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DEDICATION

Tara, Adalyn, and Cecily, this one's for you.

1 Introduction

This study hypothesizes and finds evidence that increased corporate tax avoidance is a significant real effect of financial reporting information opacity. On a practical process level there are compelling reasons to believe that the opacity of a firm's information environment will have an effect on tax avoidance. Implicit within each amount claimed as either an income or deduction on the corporate tax return is the underlying economic activity and the revenue or expense as reported by management in the financial report, both of which preceded it. As all information available to investors and analysts is also available to tax-enforcing entities, to the extent that the firm's financial information environment is opaque, the firm may be better able to obfuscate its tax liability to government agencies and thus avoid more tax. My findings are consistent with this explanation - that the direction of the association is such that opacity leads tax avoidance.

Despite this intuitive link between information environment and tax liability, tax avoidance as a real effect of opacity or opacity as a determinant of tax avoidance is largely overlooked within the literature. Filling this gap is useful for at least two reasons. First, the literature struggles to explain the cross-sectional differences in opacity given that opacity hurts firm value (e.g., Bhattacharya et al. 2003) and also still seeks to understand the overall benefits and costs of financial opacity. One possible benefit, that may help to outweigh the costs, is the ability of opaque firms to avoid taxation. Second, tax avoidance is a significant global economic phenomenon. A recent study by the Tax Justice Network (2011) estimates the size of tax evasion, where tax evasion is a lower bound for tax avoidance, at 5.1 percent of global gross domestic product (GDP).[1] Thus, providing evidence on a link between opacity and tax avoidance can have important implications for both academic and policy debates.

[1] To put this in perspective, tax evasion is equal to 54.9 percent of worldwide healthcare expenditure, a ratio only so low due to the USA having the highest healthcare costs and the highest GDP yet one of the lowest tax evasion rates. In contrast, the unweighted average tax evasion to health care spending ratio is 110 percent meaning that, in most countries, tax evasion exceeds healthcare spending.

Two recent working papers have begun to consider the relationship between opacity and tax avoidance, but do so with mixed results and in stylized settings, leaving the question open for additional study. First, Wang (2010) investigates tax avoidance in the context of firm value and information opacity for S&P 1500 firms from 1994 to 2001 and finds that opaque firms avoid less taxes than their transparent counterparts. Wang (2010) argues that this negative association is a result of value-conscious corporate management. In contrast to this, Balakrishnan et al. (2011) argue that tax aggressiveness causes increased corporate organizational complexity, and therefore hypothesize that increased tax avoidance will lead to a lower level of financial reporting transparency. Using a new measure of tax avoidance, Balakrishnan et al. (2011) control for determinants of opacity and find a positive relationship between tax avoidance and opacity for a sample of domestic-only firms. It should also be noted here that, though they do not provide direct tests of the causal aspect of their hypothesis, Balakrishnan et al. (2011) assume one direction of causality, while this study hypothesizes and finds evidence consistent with the association running in the opposite direction.

Along with these mixed findings, there is also tension outside the literature. First, though it has been shown that firms attempt to guide analysts, the firm's information environment is not entirely within the firm's control and even if it were there are still many countervailing incentives (of which taxes may be one) that would affect a firm's decisions regarding transparency. Second, to the extent that book and tax are linked and to the extent that firms face incentives to manage earnings upward to meet analyst or market expectations, firms may be unable to keep taxable income low while also meeting those expectations. Therefore, whether and to what extent financial opacity affects firm-level tax avoidance remains largely an unresolved and important empirical question.

To study the relationship between opacity and tax avoidance, I use an international setting with a broad sample of cross-country market, financial, and analyst data. An international setting is particularly relevant to the research question due to the cross-sectional

variation present in both the information environment and tax avoidance behaviors found between countries and the firms domiciled within them. While an international setting has the potential advantage of greater congruence between book and tax, this can also be a disadvantage as incentives with higher order than tax may take precedence. In addition, the recent adoption of International Financial Reporting Standards (IFRS) by various countries around the world as well as the initial enforcement of insider trading laws over the last few decades allows for natural experiments using difference-in-difference analyses to test predictions regarding the causal direction of the association. Finally, the use of an international setting also allows for the study of tax avoidance in the aggregate by testing cross-sectional differences in government-collected corporate tax revenues and how those revenues vary with country-level measures of opacity.

I follow Bushman et al. (2004b) and define the opacity (transparency) of the financial reporting information environment as the unavailability (availability) of firm-specific information to those outside the firm. For parsimony, this construct is frequently referred to simply as opacity. Conceptually, the construct opacity is the inability of outsiders to pierce the cloud of the firm and see through to its underlying operations and activities. To measure firm-level opacity I use proxies for information uncertainty, information asymmetry, and earnings quality commonly used in the literature, including: the absolute value of analysts' forecast error, analysts' forecast dispersion, the average bid-ask spread, and performance-adjusted discretionary accruals. In addition, country-level proxies of opacity include: an index of corporate governance, an index of disclosure requirements, the extent of news media penetration, and the mandatory adoption of IFRS.

I define tax avoidance broadly as any activity, legal or otherwise, that reduces a firm's tax liability per dollar of pre-tax earnings. This definition follows from such papers as Hanlon and Heitzman (2010a) and is widely used in the literature. Firm-level tax avoidance is measured using two different but complementary variables, namely the spread between the applicable country-year statutory tax rate and either 1) the firm's cash effective tax rate (cash ETR)

for the year, or 2) the firm's reported effective tax rate (reported ETR) for the year. Both the cash and reported ETR are frequently used within the tax avoidance literature.

This study begins by extending the prior literature by testing the association between opacity and tax avoidance in an international setting. The results of this first set of analyses indicate that both firm- and country-level opacity are incrementally and significantly associated with greater firm-level tax avoidance.[2] Specifically, each of the four firm-level opacity proxies is positively associated with tax avoidance, suggesting that tax avoidance increases as opacity increases. In addition, tax avoidance is also positively associated with a new summary opacity measure: an index score created from the four firm-level opacity measures. Similarly, results from regressions using four country-level indicators of opacity also show that country-level opacity is significantly associated with greater firm-level tax avoidance and is incremental to firm-level opacity (as measured by the opacity summary index measure). Since firms are less likely able to influence country-level opacity through their individual tax avoidance activities, this is initial evidence that opacity may lead tax avoidance.

The next tests directly investigate this preliminary evidence on the direction of the association using firm-level data. Specifically, I test the directional hypothesis that an opaque financial information environment has an effect that naturally leads and may potentially be exploited by management to obfuscate the firm's tax avoidance activities to taxing authorities. This analysis uses difference-in-difference regression models utilizing first, the adoption of IFRS, and then second, the initial enforcement of insider trading laws, as an exogenous shock to the financial reporting environment of the firm and tests how these shocks to opacity affect tax avoidance. In tests using the adoption of IFRS, I also limit the treatment group to exclude those countries with tax regime changes around the time of adoption to ensure that the effect on tax avoidance is not confounded by coinciding changes to tax laws. The results from both tests provide direct evidence consistent with opacity causing tax avoidance.

[2]These findings are consistent with the domestic, firm-level results of Balakrishnan et al. (2011).

To further examine the relationship, I next interact opacity with IFRS adoption and investigate the effect this interaction has on tax avoidance for those countries that maintained their tax regime immediately before and after mandatory IFRS adoption. Results from this test suggest that IFRS adoption attenuates the ability of firms to use opacity to avoid taxes and is consistent with the argument that the reduction in tax avoidance due to IFRS adoption is because of a decrease in opacity. Additionally, results from a lag analysis where the main regression model is modified to include either lagged opacity or lagged tax avoidance show that lagged opacity continues to have a significant and positive association with unlagged tax avoidance, whereas the model using lagged tax avoidance and unlagged opacity fails to find a significant association. The results of all these tests together strengthen the argument that tax avoidance follows from the information environment facing the firm.

Further analysis presents evidence that the positive association between opacity and tax avoidance is strengthened for firms with opportunities to extract private benefits. Financial opacity is a logical mechanism to investigate the connection between rent extraction and tax avoidance as both require some level of covertness, something that opacity can provide. These tests follow from and provide new evidence to the observation made in Hanlon and Heitzman (2010a) that "the theory from Desai and Dharmapala (2006) that rent extraction[3] and tax avoidance require complementary technologies is an interesting angle and is underexplored."

Finally, the positive association between opacity and tax avoidance is robust to a wide range of alternative specifications for the cash ETR and reported ETR and the summary opacity index measure. In addition, the association is also robust to other model specifications and sample restrictions, including adjusting the sample to remove U.S. firms and employing yearly cross-sectional (Fama and MacBeth 1973) regression models. The results of all robustness tests remain qualitatively similar to the initial firm-level results.

[3]Rent extraction is defined broadly and includes a wide range of behaviors such as perquisite consumption, otherwise excessive amounts of executive compensation (regardless of form), non-arms-length or related-party transactions, and outright theft. In addition, earnings management, to the extent that it inflates stock price and allows for insiders to take abusive action and extract gains, would also fall under this umbrella.

This study contributes to the existing literature in several ways; first, by documenting the robust, positive relationship between opacity and tax avoidance and extending these findings to a sample of international firms; second, by establishing that country-level opacity has an incremental effect to firm-level opacity on both firm-level tax avoidance and in the aggregate with collected country-level corporate tax revenue as a percentage of GDP; third, by presenting evidence showing that the association between opacity and tax avoidance is strengthened for firms with opportunities to extract rents; and fourth, by providing direct evidence that opacity has a causal association with tax avoidance by using two separate exogenous shocks to opacity to show that tax avoidance decreases following those shocks. In summary, the results suggest that opacity is a significant, yet overlooked, determinant of tax avoidance and that the link between the two has important implications for practitioners, regulators, researchers, and governmental tax-enforcement entities. In addition, the frictions and market costs related to opacity and the tension between opacity and book-tax congruence may help to explain the observation in Armstrong et al. (2012) that some firms appear to engage in more conservative tax planning than might otherwise seem to be optimal.

This paper joins with others in answering the call in Shackelford and Shevlin (2001) for additional research that investigates the cross-sectional determinants of firm-level tax avoidance and extends the body of literature by looking to the overall information environment of the firm as a potential and important determinant of its tax avoidance activities. In addition, this paper joins a small, but growing body of international research that has sprung up in recent years to investigate the incentives for tax avoidance across the globe by utilizing country-specific variation (for examples, see Amiram et al. 2011 and Atwood et al. 2011).[4]

[4]Amiram et al. (2011) note that past tax avoidance research has focused mostly on classical systems - that is systems where both the corporation and shareholders pay tax on the same income. Exploiting country-specific imputation systems (which at least partially eliminate the double taxation of corporate profits as found in the U.S.), they hypothesize and find that firms located in countries with imputation tax systems have a weaker incentive to avoid taxes. Atwood et al. (2011) investigate various country-specific tax structures including a worldwide taxing regime, required book-tax conformity, statutory corporate tax rates, and the perceived level of tax enforcement and find that firms avoid less taxes when a worldwide approach is used, required book-tax conformity is higher, statutory corporate tax rates are lower, and tax enforcement is perceived to be stronger. However, upon further investigation they find that the relationship between tax

The rest of this paper is organized as follows. Section 2 develops the empirical predictions while providing an overview of the relevant literature. Section 3 details the research design. Section 4 outlines the sample selection as well as presents the results of all significant tests. Section 5 concludes and poses possible areas of additional inquiry.

2 Empirical Predictions

This study builds upon the intuition that a firm's economic activities are common to both its financial and tax functions and that both the economic activity and financial reporting occur prior to reporting for tax purposes. For example, when an economic activity occurs it is first reflected within the management reporting system. This information is then packaged, usually in several different ways depending on the intended audience and their needs, so that it can be effectively reported to management, analysts, shareholders, and other users (e.g., a firm's economic activities are translated through the lens of the local GAAP and then made publicly available in its annual and quarterly financial statements). After these activities and amounts have been used for financial purposes, they are then further subjected to tax laws to produce filings suitable for tax authorities. This common process suggests that opacity could be associated with tax avoidance for two reasons. First, although the information is subjected to additional tax laws, it is often the case (especially in an international setting) that a firm's tax amounts follow closely from its local GAAP amounts and thus opacity for financial purposes directly precedes and contributes to opacity for tax purposes. Second, all information that is available to investors and analysts is necessarily also available to tax-enforcing entities such as the Internal Revenue Service (IRS). Therefore, any activity or amount that a firm wishes to obfuscate from tax authorities must, by necessity, also be excluded from or obfuscated in its public disclosures.

avoidance and each of the four tax system characteristics is contextual and depends largely upon the variable compensation of management.

In addition, this study builds primarily upon two distinct streams of literature, namely those of corporate transparency (the inverse of opacity) and tax avoidance. A large body of research shows the market effects of corporate transparency in an international setting, including Leuz and Verrecchia (2000), Daske et al. (2008), and Lang et al. (2011). Specifically, these studies show that greater financial transparency at the firm-level is associated with lower bid-ask spreads and a greater level of liquidity. In addition, Francis et al. (2004) and Francis et al. (2005) show that corporate financial reporting quality is an important determinant of both the firm's cost of equity and its cost of debt. Also related, but in a slightly different vein, is Bushman et al. (2004a). This study notes that organizational complexity (where greater complexity is associated with reduced reporting transparency) can hinder the efforts of investors to understand firm operations and value.

The impact of corporate transparency, however, is not limited to overall market consequence. Corporate transparency can also serve a disciplinary role for corporate insiders resulting in a better selection of investments, more efficient management of assets in place, and a reduction in the expropriation of minority shareholders' wealth (see Bushman and Smith 2001). This line of argument suggests that corporate transparency can also affect specific real corporate activities, of which tax avoidance is one. As an example of how opacity may affect real activities, McNichols and Stubben (2008) examine whether firms with opaque financial reporting also make suboptimal investment decisions and find that such firms tend to over-invest. Following this line of thought, as the underlying economic transactions, accruals processes, and firm operations and structures become more opaque, tax avoidance activities can more easily proliferate.

Increased tax avoidance being associated with opacity, however, is not a foregone conclusion. Scholes et al. (2009) detail how managers face tradeoffs between financial reporting and tax avoidance. These tradeoffs are often due to the conflicting motives that management has to produce higher results for financial purposes, yet at the same time to minimize the firm's tax liability. Especially in an international setting where the association between tax laws

and the local GAAP is stronger than in a purely domestic one, economic transactions are often reported in a similar fashion for both book and tax reporting purposes (e.g., income or expense in period A for book purposes is also an income or expense in period A for tax purposes), thereby limiting the degree to which these two numbers can be driven apart. To the extent that financial reporting or market concerns outweigh tax concerns, and to the extent that firms manage earnings to meet those concerns, then a firm's tax liability may also increase as earnings are managed.

Notwithstanding, recent studies show that management has incentives for avoiding tax and are often rewarded for doing so. For example, Rego and Wilson (2008) examine the impact that executive compensation has on tax risk/aggressiveness and find that executive compensation and tax aggressiveness are positively related. Further studies show that this association reflects efficient contracting rather than a form of rent extraction. Using a proprietary data set of detailed executive compensation, Armstrong et al. (2012) investigate the pay-related incentives of the tax director and find a significant and negative relationship between the tax director's level of compensation and the firm ETR. However, they fail to find much of a relationship with any other tax-related variable, suggesting that tax directors have an incentive to reduce the reported tax expense for financial statement purposes.[5]

While past studies exploited firm-specific characteristics as proxies for firm-level opportunities and incentives (see Zimmerman 1983 and Gupta and Newberry 1997)[6], more recent studies have looked to agency costs, managerial incentives, and corporate governance to explain a firm's level of tax avoidance (see Desai and Dharmapala 2006, Desai et al. 2007, and Desai and Dharmapala 2009). For example, Desai and Dharmapala (2006) find a negative association between the level of tax sheltering and incentive compensation with the associa-

[5]Additional examples of recent studies involving agency costs, governance, and managerial incentives include Desai et al. (2007) and Dyreng et al. (2010).

[6]Zimmerman (1983) looks at the relation between firm size and firm-level ETRs (as a component of political costs) and finds evidence consistent with larger firms engaging in income-reducing accounting activities in order to mitigate the increased government scrutiny they incur over smaller firms. However, using the Tax Reform Act of 1987 (TRA), Gupta and Newberry (1997) find conflicting evidence that firm-level ETRs are not associated with firm size when looking across longer horizons. Instead, they show that ETRs are related to capital structure, asset mix, and firm performance both before and after the TRA.

tion being mostly driven by firms with weak corporate governance. They argue that through the use of incentive-based compensation, managerial incentives are better aligned with those of shareholders and that these high-powered incentives reduce agency costs by discouraging management from participating in activities that would otherwise involve rent extraction.

To the extent that the agency cost view of tax avoidance predominates, then opacity, under the guise of less transparent accounting and financial reporting and a lower level of coverage by information intermediaries, may create a shield under which managerial opportunism thrives leading to increased tax avoidance. Under this point of view, one would expect a positive association between opacity and tax avoidance. However, prior research also shows that information transparency allows outsiders to better monitor managerial activities and discretion (see Lang et al. 2004), which includes the tax function. Therefore, if tax avoidance is value-enhancing and management communicates this through transparency, then transparency may instead be associated with increased tax avoidance. Under this alternative view there would be a negative relationship between opacity and tax avoidance. Finally, to the extent that both of the above effects exist and neither predominates (or the effects cancel out one another), then an empirical analysis should lead to no discernible association.

This study begins by relying upon the agency cost theory of tax avoidance and by testing the intuition that a firm's economic activities are common to both its book and tax functions and by seeking to clarify the mixed findings of the prior literature. Therefore, the first hypothesis is as follows:

> H1: Opacity, at both the firm and country level, is associated with increased firm-level tax avoidance.

This hypothesis also leads to predictions for country-level aggregate tax avoidance (as opposed to firm-level tax avoidance). Since corporate tax revenues collected by a country are the sum of individual firm-level taxes paid, and to the extent that opacity is associated with tax avoidance at the firm-level, the hypothesis and association should continue to hold when investigating opacity and taxes collected at the country-level.

H1 above hypothesizes about the association between tax avoidance and opacity. However, it also leads to questions about the direction of this association as the intuition and theory behind the hypothesis is that opacity creates an environment that management can exploit to obscure taxes and reduce the firm's tax liability. An international setting provides a laboratory-like setting for testing the causal direction of this association. Starting December 31, 2005, countries began mandating the adoption of IFRS, including many EU countries, Australia, and New Zealand. Several studies have shown that IFRS, when compared to many local GAAPs, provides more extensive measurement and disclosure rules, along with many capital market benefits, accounting property improvements, and a positive effect on analysts' ability to forecast future earnings (see Ding et al. 2007, Bae et al. 2008, Daske et al. 2008, Byard et al. 2011, and Landsman et al. 2012). Due to the adoption of IFRS within a country being outside the firm's control, as well as the improvement in the information environment that accompanied such adoption, I use the mandatory adoption of IFRS as an exogenous shock to opacity. To the extent that tax avoidance follows opacity and to the extent that IFRS adoption was not also accompanied by a change to the country's tax regime, it follows then that IFRS adoption will lead to a decrease in tax avoidance for those firms in countries that experienced the shock relative to those that did not. However, to the extent that tax avoidance leads to opacity, there should be no such effect post adoption. This leads to the second hypothesis:

> H2: The adoption of International Financial Reporting Standards, an exogenous shock to the information environment, decreased the tax avoidance activities of the firm relative to non-adopters and the pre-adoption period.

This second hypothesis is notable for its prediction in regard to the flow of information between book and tax. Prior literature shows that both book and taxable income provide information to investors and market participants (see Hanlon and Heitzman 2010b) with many studies finding that book-tax differences are informative as to the growth and persistence of firm-level earnings (see Lev and Nissim 2004 and Hanlon 2005) and that taxable

income has information content incremental to book income such that book-tax conformity may reduce the amount of beneficial information available to the marketplace (see Hanlon et al. 2005 and Atwood et al. 2010). This vein of literature implies that tax expenses and book-tax differences are informative due to their ability to capture an element of some underlying and broadly defined earnings quality or earnings management behavior. This second hypothesis, however, stands apart from these previous studies by predicting that the effect from the flow of information between financial and tax may also run in the opposite direction.

Similar to H2 above, I also construct a hypothesis in regards to the enforcement of insider trading laws: that the initial enforcement of insider trading laws, an exogenous shock to the information environment, decreased the tax avoidance activities of the firm relative to countries without such enforcement and the pre-enforcement period. Prior literature suggests that, following the initial enforcement of insider trading laws, analyst following increased, analysts began forecasting a broader set of measures, and that financial reporting quality improved (see Bushman et al. 2005, Hail 2007, and Zhang and Zhang 2012). Thus, the initial enforcement of insider trading laws is another potential exogenous shock to the information environemtn with which I can test whether an improvement in information transparency precedes a reduction in tax avoidance.

Finally, Desai and Dharmapala (2006) suggest that rent extraction and tax avoidance may require additional technologies. Financial information opacity is a particularly compelling mechanism for which both rent extraction and tax avoidance may exist due to the complementary environment it provides for both. Indeed, to the extent that tax avoidance and rent extraction occur and to the extent that they rely on the same organizational and transactional structures, an opaque information environment would be an ideal setting in which management would be able to pursue both simultaneously. This leads to the third and final hypothesis:

H3: Opacity provides the firm and its management the joint opportunities and processes necessary to engage in both rent extraction and tax avoidance.

3 Research Design

To test the empirical predictions, I estimate a series of pooled OLS regressions of the following general form:

$$TaxAvoid_{i,t} = \gamma_0 + \gamma_1 Opacity\,Characteristics_{i,t} + \beta_1 Controls_{i,t} + Fixed\,Effects + \varepsilon_{i,t} \quad (1)$$

where *Opacity Characteristics* is the primary variable of interest, the proxies and measurement of which are described in detail, along with *TaxAvoid* and *Controls*, in the following sections. In addition, standard errors are clustered by firm and year (see Gow et al. 2010) to account for possible correlation in residuals. To reduce the undue influence of outliers, all firm-level continuous variables are winsorized at the top and bottom percentile of their respective distributions.

3.1 Measuring firm-level opacity

Because opacity is inherently difficult to measure, I use the following five separate indicators as proxies for the availability of firm-specific information: analysts' forecast error, analysts' forecast dispersion, performance-adjusted discretionary accruals as calculated in Kothari et al. (2005) and Frank et al. (2009), the average bid-ask spread, and a summary opacity index score based upon the other four measures.[7] Higher values of each measure of opacity correspond to higher levels of opacity.

The first analyst-based measure, *ForErr*, is calculated as the absolute value of the most recent analysts' mean earnings per share (EPS) forecast less the actual EPS for the year,

[7] A detailed description of the measurement of all variables can be found in the Appendix.

both from I/B/E/S, scaled by the firm's stock price at the beginning of the fiscal year. The most recent analysts' mean EPS forecast used in the calculation is the last analysts' forecast prior to the actual EPS. Similarly, the second analyst-based measure, *ForDisp*, is calculated as the dispersion of analysts' forecasts scaled by the firm's stock price at the beginning of the fiscal year. Both *ForErr* and *ForDisp* have been shown to be related to greater transparency in the firm's information environment and reflect the ability of outsiders to the firm to process firm-related information (see Lang and Lundholm 1996 and Jin and Myers 2006). In addition, it follows intuitively that as a firm become more opaque (i.e., further limits the avialability of firm-specific information) that those analysts following the firm will have a reduced ability to forecast that firm's important financial measures, such as earnings. Therefore, analyst forecast error and dispersion will increase.

The third measure follows Kothari et al. (2005) and Frank et al. (2009) and is a measure of performance-adjusted discretionary accruals, or *DiscAcc*. This measure calculates discretionary accruals based on the modified-Jones model (per Dechow et al. 1995) with performance-matching based on Francis et al. (2005). An extensive literature in accounting shows that firms with earnings that exhibit greater levels of earnings management are more likely to have a lower quality accounting and therefore exhibit greater opacity. In addition, this measure has been used to capture financial reporting aggressiveness (see Frank et al. 2009) and has been shown in a domestic sample to be related to the level of discretionary permanent differences.

The fourth measure of firm-level opacity is the natural logarithm of the average bid-ask spread, *BidAskSpr*, and follows Anderson et al. (2009). Due to data limitations regarding intra-day detail for the international sample, the bid-ask spread used here as simply the natural logarithm of the average of the daily spread. The bid-ask spread is a measure of information uncertainty and relates to the inability of market participants to agree upon a price for the firm's equity offerings. Finally, an overall measure of firm-level opacity is constructed as an index based upon the four firm-level opacity measures. This opacity

index, *OScore*, increases in value by one for each of the four firm-level opacity measures that is above the sample median and thus takes a value ranging from 0 to 4.

3.2 Measuring country-level opacity

In addition to firm-level measures of opacity, I also investigate the association between tax avoidance and four country-level measures of opacity. The first country-level opacity variable is the governance disclosure measure from Bushman et al. (2004b), *Governance*. Bushman et al. (2004b) show that the quality of a country's corporate governance infrastructure, and its required disclosures about this infrastructure, are an important determinant of corporate reporting transparency. As with all the country-level measures, and opposite to the firm-level opacity measures, higher values of Governance correspond to lower levels of opacity (higher levels of transparency).

The second country-level opacity measure, *Disclosure*, is the financial disclosure requirements as reported by La Porta et al. (2006). La Porta et al. (1997) document that indicators of the country-level required disclosure intensity are important determinants of a firm's information environment. The third measure, *MediaPen*, follows Maffett (2011) and is a measure of the extent that news media have penetrated a country. Bushman et al. (2004b) show that the lack of a well-developed media communication infrastructure limits the flow of firm-specific information to interested parties, which increases information opacity.

The final measure, *PostIFRS*, is an indicator variable for country-years that have mandated the use of IFRS. Many studies within the accounting literature (see Hail and Leuz 2009) have shown that the use of a well-developed international form of GAAP, such as IFRS, can have beneficial effects on the overall quality of a firm's information environment.

3.3 Measuring tax avoidance

I define tax avoidance as any activity, legal or otherwise, that reduces a firm's tax liability per dollar of pre-tax earnings. This definition conforms closely to others used in the literature

(see Hanlon and Heitzman 2010a), and follows directly from Frank et al. (2009) which defines tax aggressiveness as the "downward manipulation of taxable income through tax planning that may or may not be considered fraudulent tax evasion."[8] Thus, for purposes of this study, tax avoidance is not strictly limited to those activities that are legal, but may also include otherwise abusive or illegal transactions.[9]

There are several proxies for tax avoidance that have been used in the literature, including: reported effective tax rate, cash effective tax rate, temporary book-tax differences, permanent book-tax differences, and operations in jurisdictions labeled as tax havens. Due to data restrictions of the international sample, I calculate measures based upon the reported and cash effective tax rate only. To be able to calculate many of the alternative measures of tax avoidance, such as the level of book-tax differences or operations in tax havens, would require data that is unavailable for a large portion of the sample and thus require that those observations be dropped, severly shrinking the sample size and limiting the power of statistical tests.[10]

To calculate the measures of tax avoidance I follow Amiram et al. (2011) and use the spread between the enacted corporate statutory tax rate (CSTR) and the cash effective tax rate, *CETRSpr,* as well as the spread between the enacted CSTR and the reported effective tax rate, *ETRSpr*. More positive spreads of both the cash ETR and ETR relative

[8]Although this definition is broad and widely accepted, not all studies define tax avoidance this way. For example, Rego (2003) defines tax avoidance as only those activities which legally reduce a firm's tax payments while Desai and Dharmapala (2006) define it as synonymous with abusive tax sheltering.

[9]Forms of illegal or abusive tax avoidance often used within the literature include three separate concepts of tax evasion, tax noncompliance, and tax sheltering. Tax evasion is used to refer to those tax reporting activities which, if discovered, would lead to civil or criminal sanctions (see Crocker and Slemrod 2005). Tax noncompliance refers to corporate income tax which is justly due but goes unpaid to the taxing authority (see Slemrod 2004). Lastly, tax sheltering refers to often complex transactions and tax loopholes which are marketed and sold to corporations, often by accounting or legal firms, for the sole purpose of reducing corporate tax liabilities (see U.S. GAO October 21, 2003 and Hanlon and Slemrod 2009). Tax shelters often involve the manipulation of many different parts of the tax code and are, by their very nature, varied, sophisticated, and difficult to both measure and detect.

[10]Financial statement data is not as readily available in *Datastream Advanced Database* as it is in other datasets such as *Compustat*. Examples of missing tax-related data necessary for the calculation of other measures of tax avoidance, such as book-tax differences, include domestic income, state, local, and other taxes, and tax loss carryforwards.

to the benchmark of the corporate statutory tax rate are assumed to imply more firm-level corporate tax avoidance.

Both the unbenchmarked cash and reported effective tax rates are widely used as measures of tax avoidance within the literature for domestic settings. Using the corporate statutory tax rate as an adjusting benchmark to calculate the spread of both rates has the advantage of implicitly controlling for unobserved time-varying country-level characteristics present in an international setting that may not otherwise be controlled for through fixed effects. In addition, cash ETR measures have the benefit of being less sensitive to country-specific financial accounting standards, whereas measures using the reported effective tax rate does not have that advantage.

The measurement of *CETRSpr* is based upon the cash ETR constructs used in Dyreng et al. (2008). Dyreng et al. (2008) calculate the cash ETR over a five-year period to study those firms that consistently pay less in corporate taxes. However, due to data restrictions that would substantially reduce the size of the sample and country representation if I were to calculate the measure over a five-year period, the calculation of *CETRSpr* here is limited to include only a single year. Specifically, *CETRSpr* is defined as the corporate statutory tax rate of the country in which the firm resides less that firm's annual cash ETR, where cash ETR equals the cash taxes paid divided by pre-tax income adjusted for discontinued operations and extraordinary items.

While the cash ETR measures the cash paid to taxing authorities, prior research shows that investors, and thus management, focus on earnings over cash (see Sloan 1996). Therefore, I also use the spread between the reported effective tax rate and the statutory rate since the reported ETR more directly impacts a firm's earnings (in juxtaposition to the cash ETR which uses cash taxes paid) on which a company and its management are likely to focus. *ETRSpr* is calculated as the difference between the firm's annual ETR and the CSTR of the country in which it is domiciled, where ETR equals the income tax expense for the year divided by pre-tax income adjusted for discontinued operations and extraordinary items.

In addition to the above two measures, I also test the robustness of the results against a number of alternative specifications using the CSTR and firm-specific tax rates, including the ratio of the annual firm-level rates (cash ETR or reported ETR) to the CSTR, labeled *CETRSca* and *ETRSca*, respectively. Unlike the spread measures, higher ratios are assumed to imply less corporate tax avoidance relative to the statutory benchmark. In addition, each of the cash ETR and reported ETR proxies is calculated without adjusting pre-tax income for discontinued operations and extraordinary items resulting in four more measures, *CETR2Spr*, *CETR2Sca*, *ETR2Spr*, and *ETR2Sca*. Lastly, I also calculate the cash ETR and reported ETR without first difference or scaling by the CSTR and use the measures in models both with and without the CSTR as an additional control variable.

3.4 Control variables

Consistent with prior studies in the tax avoidance literature, I include an extensive list of additional variables to control for factors other than opacity that are likely to be associated with tax avoidance (see Gupta and Newberry 1997, Rego 2003, Dyreng et al. 2008, Frank et al. 2009, and Wilson 2009). The rationale behind including these controls is to capture the extent to which firms may be limited in their ability to either decrease taxable income or increase tax credits. A detailed description of the calculation of each control variable can be found in the Appendix.

The first control is the presence of a Big-5 auditor, *Big5*, and is included as the tax avoidance activities of firms audited by a Big-5 auditor are likely to be different from those audited by others for two potentially conflicting reasons. First, firms often use the same accounting firm for tax consultant services as they do for audit services, meaning that firms employing a Big-5 auditor are also likely to have access to more sophisticated tax avoidance techniques. However, and in opposition to that, due to the increased scrutiny of a Big-5 audit, the tax provision and its generating processes are also likely to undergo an increased level

of scrutiny. Therefore, the coefficient on *Big5* may be either positive or negative depending upon which effect dominates.

As a potential measure of tax sophistication, I include a measure for firm age, *Age*. Firms that have been established for longer are also more likely to have more advanced tax policies in place as well as having more refined tax avoidance behaviors. Following Amiram et al. (2011) I also include firm-level return on assets, *RoA*, and leverage, *Lev*, measures to control for the increased incentives and opportunities that both profitable firms and firms with greater leverage (or complex financing arrangements) have to avoid taxes. *Size*, the natural logarithm of assets, is a control for the influence that firm size may exhibit upon the tax function and has been shown to be related to tax avoidance in Zimmerman (1983). Additionally, prior studies suggest that operations in foreign jurisdictions may give the firm an increased opportunity to avoid taxes and so an indicator variable to control for firms with foreign operations, *ForOps*, is included as a measure for the presence of foreign-based income. In addition, the book-to-market ratio, *BM*, is a control for the growth opportunities of the firm as firms with stable growth may avoid more tax on average.

Following Bauer (2011), I also control for the potential constraint a firm has on its cash flows (*CFConstrnt*) and for consecutive accounting losses (*AggLoss*). Firms with poor performance are likely to have fewer financial resources available to allocate to their other functions and therefore are likely to allocate fewer resources to their tax function in comparison to firms without similar constraints. Thus, these firms are likely to pay tax at a rate much closer to the country-specific statutory tax rate as they instead focus on returning to profitability rather than on tax avoidance activities. *Intang* and *RnD* control for the intensity of intangibles and research and development, respectively. Firms with high levels of intangible assets and intellectual property may be able to shift those assets and income-producing activities more easily to foreign jurisdictions and thus be able to exploit the lower statutory rates of other tax regimes. However, these variables are also likely to have different treatment for book and tax purposes (see Chen et al. 2010), leading to a possible ambiguity in

their relationship to tax avoidance. Similar to the control for intangible assets, *PPE* controls for the effect of tangible assets. Because *PPE* and *Rn*D are expected to generate large tax deductions which would work to decrease the tax base, both are expected to be associated with lower taxes relative to the corporate statutory tax rate benchmark.

Additionally, prior research has shown that firms with a U.S. American Depositary Receipt have greater transparency due to a higher level of institutional holdings (see Lang et al. 2003). To the extent that the financial reporting environment of the firm influences its tax avoidance activities, it is likely that firms cross-listed in the United States will also have different tax payment tendencies than firms domiciled in the same jurisdiction but not cross-listed in the United States. Therefore, *ADR* controls for firms that choose to cross-list in the U.S. during each period.

Finally, prior research shows that deferred taxes vary across industries (e.g., Lev and Nissim 2004 and Hanlon 2005). Therefore, I include industry fixed effects for each two-digit Industry Classification Benchmark (ICB) industry. The ICB is an industry classification taxonomy created by Dow Jones and the FTSE Group and is used globally to divide the market into increasingly specific and well-defined sectors and subsectors. In addition to industry fixed effects, I also include fixed effects for both the year and home country of the firm in the event that tax avoidance varies across both time or location as well as to control for otherwise unobserved year and country characteristics.

4 Sample and Results

Firm-level fundamental and financial variables are obtained from Thomson Reuters *Datastream Advanced Database*. More specifically, firm-level financial data is taken from *Worldscope* and market data from *Datastream*. Analyst-related data is obtained from the Institutional Brokers' Estimate System (*I/B/E/S*). In addition, country-level data regarding statutory tax rates is collected from the Organisation for Economic Co-operation and Devel-

opment (OECD) website or, where necessary, by hand. I use all firm-year observations with necessary data between the years 1993 and 2008. The analysis begins in 1993 due to the general lack of tax-related data on *Worldscope* prior to that time. In addition, the analysis is stopped at 2008 due to the global changes related to the escalating financial and housing crises occurring at that time and resulting austerity measures imposed by various countries. Because lagged variables, such as total assets, are used in the measurement of variables, the year 1993 is essentially eliminated from the analysis. After eliminating all observations that lack the necessary data to construct all variables, the final sample includes 71,652 firm-year observations for the least restrictive model, though the sample size for each individual test may be less due to additional data restrictions.

4.1 Descriptive statistics

The composition of the sample by country is shown in Table 1. This table presents characteristics for country-level opacity variables, corporate statutory tax rate, and IFRS and imputation years. As seen, the sample includes 42,199 firm-year observations with enough data to estimate the least restrictive model using *CETRSpr* and 71,652 firm-year observations with enough data to estimate the least restrictive model using *ETRSpr*. The difference in number of observations between *CETRSpr* and *ETRSpr* is the result of less data availability in *Worldscope* for cash taxes paid (WC04150) in comparison to total income tax expense (WC01451). Both samples include 30 countries with broad variation in enacted policies, information environment, and corporate statutory rates. An advantage of this international sample is that it is not dominated by the largest most heavily followed firms and, as a result, contains a substantial number of firms for which opacity issues are likely more pronounced. The United States is the most represented country with either 37.1 (*CETRSpr*) or 35.9 (*ETRSpr*) percent of the sample domiciled within its borders. Japan and the United Kingdom make up the next largest with 18.1 (*CETRSpr*) or 13.1 (*ETRSpr*) and 15.8 (*CETRSpr*) or 12.9 (*ETRSpr*) percent, respectively. In addition, a few other European countries and

Australia also see modest gains in representation in the cash ETR sample as compared to the reported ETR sample. Additional details regarding the country composition of a specific subsample used in a main test can be found in the country composition panels preceding that test.

Table 2, Panels A and B presents a summary of firm-level descriptive statistics. Panel A shows descriptive statistics for the least restrictive models using *CETRSpr*, while Panel B shows descriptive statistics for the least restrictive models using *ETRSpr*. These statistics are particularly useful when determining the economic significance of subsequent regression coefficients. Both *CETRSpr* and *ETRSpr* have mean and median values greater than zero, indicating that the average firm both expenses and pays tax at a rate less than the corporate statutory rate. A comparison between the two panels shows slight differences in sample characteristics with the cash ETR sample containing firms that are, on average, slightly older, larger, and more profitable. Overall, however, the firms appear comparable across samples with both containing a diverse group of firms, ranging from small to large, old and young, with a broad representation of profitability, growth opportunities, investment decisions, and information environment. Similar to the country composition panels, additional details regarding the summary statistics of a specific subsample used in a main test can be found in the summary statistic panels preceding that test.

Table 3, Panel A presents a correlation matrix of variables of interest with Pearson correlations reported below the diagonal and Spearman correlations above the diagonal based upon the most restrictive model using listwise deletion. A similar correlation matrix can be found in Table 3, Panel B, which reports the Pearson correlations for the least restrictive model using pairwise deletion. Most of the firm- and country-level opacity measures are significantly correlated in both panels, suggesting that they capture a shared underlying economic construct. In addition, most of the opacity measures are correlated with the tax avoidance measures and in the expected direction, giving initial credence to the first hypotheses.

4.2 Results

4.2.1 Tax avoidance and firm-level information opacity

The first hypothesis predicts that the magnitude of tax avoidance is increasing in the opacity of the financial reporting environment. Table 4 presents the results for the tests of this prediction using five different measures of firm-level information opacity. In addition, Table 4 also contains panels detailing the country composition and summary statistics used for each subsample. Column (5) of Panels A and B shows results for *OScore*, a new summary index measure that, as noted in the Appendix, is calculated by adding one to the score when each of the four opacity measures is above its sample median and thus ranges from 0 to 4. Panel A shows results using the cash ETR spread as the dependent variable while Panel B uses the reported ETR spread. In addition, Panel C reports results where the sample is limited to include those firms with requisite data for calculation both *CETRSpr* and *ETRSpr*. Country, industry, and year fixed effects are included in each model, thus allowing each regression to explicitly focus on firm-level opacity and how its variation within a particular country, industry and year relates to tax avoidance. In Panels A and B the coefficient for every measure of opacity is both significant and positive, indicating that as opacity increases, so too does tax avoidance as measured by *CETRSpr* and *ETRSpr*.

Further investigation of Panel A shows that the effect appears to be particularly strong for cash taxes paid, as all five measures of information opacity are significant at the 1-percent level for the cash ETR spread. The results in Panel B continue to be significant and in the expected direction but are slightly weaker in statistical significance. This may be due to the greater diversity of accounting rules and increased noise in the reported ETRs for an international sample. In general, the coefficients on the other variables are also significant and consistent across models, signifying that tax avoidance is associated with higher leverage, book-to-market, lower cash flow constraints, lower intangibles, and greater property, plant, and equipment (PP&E), and research and development (R&D) intensities. In addition,

Panel A shows that return on assets, firm age, and size are all positively associated with increased tax avoidance as measured by the cash ETR spread, whereas Panel B shows that Big-5 auditor, return on assets, and size are all negatively associated with an increase in the ETR spread. These findings are consistent with earlier findings within the literature regarding the ambiguity between certain firm fundamentals and tax avoidance. In addition, Panel C shows that each opacity measure is statistically significantly in relation to the cash ETR spread, whereas the results where the reported ETR spread is the dependent variable are weaker. This follows the general trend seen in Panels A and B.

Overall, the results of Table 4 on tax avoidance and firm-level opacity support the hypothesis that tax avoidance is increasing with more opaque financial reporting environments and help to clarify the mixed results of earlier studies.

4.2.2 Tax avoidance and country-level information opacity

The prior analysis controlled for country-level fixed effects and showed a positive association between tax avoidance and financial opacity. However, firm-level tax avoidance likely also depends on country-level opacity. The next analysis provides further tests of the empirical predictions through the use of four country-level opacity measures.[11] The inclusion of the firm-level summary opacity measure, *OScore*, in each model as an additional control variable means that the effect of the country-level opacity measures are incremental to the firm-level effect.

In addition to test results, Table 5 also contains panels detailing the country composition and summary statistics used for each subsample. Table 5, Panel A shows results for the four country-level variables on the cash ETR spread. The results of Columns (1) through (4) are unambiguous in showing that as country-level opacity increases, as measured by an index of governance, an index of disclosure, the level of media penetration, and the manda-

[11] These tests also have the advantage that the determinants of country-level opacity are (largely) out of the firm's control. Therefore, this limits the possibility that the documented associations are due to endogeneity, self-selection, or some other unobservable firm-level characteristic.

tory adoption of IFRS, firm-level tax avoidance decreases and that the effect is incremental to firm-level opacity (which continues to be significant and positively associated with tax avoidance). The country-level opacity results are significant at the 1-percent level for all measures. Similar to the firm-level regressions, increased tax avoidance is also associated with return on assets, size, cash flow constraints, PP&E and R&D intensities though results for leverage, book-to-market, and intangibles are weaker.

Table 5, Panel B shows results of the test using the reported ETR spread as the dependent variable. The results of Columns (1) through (4) also find that each of the country-level opacity measures continues to be significantly related to the reported ETR spread, though the significance of *OScore* is attenuated. This is in line with the firm-level findings in regard to the results being weaker for the reported ETR spread than for the cash ETR spread.

4.2.3 Directional tests of opacity and tax avoidance

The analyses thus far have shown that both firm- and country-level opacity are associated with firm-level tax avoidance. The next analysis performs tests on the direction of this association as formalized in the second hypothesis. These tests rely upon the idea that financial reporting opacity serves as a shield behind which management is able to avoid taxes and is a test of a directional hypothesis, namely that tax avoidance follows opacity. To test the direction of the association I estimate difference-in-difference regression models using the mandatory adoption of IFRS as an exogenous shock to the financial reporting environment. The adoption of IFRS led to standards that, when compared to local GAAPs, are more capital-market oriented and provide more extensive measurement and disclosure rules (see Ding et al. 2007 and Bae et al. 2008). Several studies have also shown that IFRS adoption is associated with benefits to capital markets, improvements of accounting properties, and more precision in analysts' ability to forecast earnings (see Daske et al. 2008, Byard et al. 2011, and Landsman et al. 2012). The dependent variable is the cash ETR spread because, while the change to IFRS would likely also affect the calculation of tax expense for financial

reporting purposes, a firm's cash payments made to government agencies (to the extent that the tax regime remains unchanged) should not be. Of additional concern is that the period of IFRS adoption also saw some of the adopting countries making similar changes for tax purposes. In this scenario, IFRS adoption would be a shock to both opacity and tax avoidance as measured through cash taxes paid and would therefore be unsuited for the difference-in-difference tests as an exogenous shock.[12]

To relieve this concern, I first determine tax regime changes for each country around the date of IFRS adoption. For a vast majority of the world, taxable profit is based upon the legal-entity (or statutory) accounts since the consolidated company does not exist as a legal entity against which taxes are assessed (see Ng 2009). Therefore, I isolate those countries where IFRS adoption was not accompanied by a shift in the tax regime by looking at the accounting rules governing statutory accounts for each country. To determine the tax regime and the accounting standards used for statutory accounts for the sample of countries, I rely upon two sources of data, the *Planned implementation of the IAS Regulation (1606/2002) in the EU and EEA* as provided by the European Commission and both the 2009 and 2011 versions of *IFRS adoption by country* provided by PricewaterhouseCoopers LLP. The *Planned implementation of the IAS Regulation (1606/2002) in the EU and EEA*, shows the proposed and final laws in place prior to the mandatory adoption of IFRS regarding whether the country's statutory accounting will also change or be allowed to change to IFRS post adoption. To the extent that information regarding the final laws is not available from the European Commission document, the findings are supplemented with the information contained in

[12] Christensen et al. (2012) show that the market liquidity effects previously documented as relating to the adoption of IFRS are actually dominated by changes to reporting enforcement as countries began proactively reviewing financial statements. Using the changes to reporting enforcement here, however, is problematic for many reasons. First, the findings of Christensen et al. (2012) are in regard to the market liquidity benefits of IFRS adoption and not the overall information environment (which includes analysts, earning quality, etc.). While market liquidity is an aspect of information opacity, it is not the focus of this paper. Second, of the ten countries that Christensen et al. (2012) report as initiating the proactive review of financial statement, only eight are represented in the sample here, five of which bundled the change in enforcement with IFRS adoption, making it difficult to differentiate between the two events. Furthermore, only two countries with changes in enforcement also retained their tax regimes, drastically dropping the power of potential tests. Finally, to the extent that the overall opacity shock is actually attributable to reporting enforcement and not IFRS adoption, then that should only bias against finding results using IFRS adoption.

IFRS adoption by country, first from the 2009 document and then, when necessary, from the 2011 document. Since it is unlikely that the statutory accounts would change to IFRS and then immediately back to local GAAP, I am confident in relying upon these two documents even though they weren't published until many years after IFRS was adopted.

The details regarding country-level tax regimes and statutory accounting are summarized in Table 6. As expected, the vast majority of countries use statutory accounting for tax purposes with the tax regime classified as being quasi-dependent.[13] Only five countries have tax regimes classified as independent and only Luxembourg is classified as dependent. In addition, of the 18 countries classified as quasi-dependent and that mandate the adoption of IFRS for consolidated purposes during the sample period, nine do not allow IFRS for statutory accounts, eight permit the use of IFRS for statutory accounts with only New Zealand requiring its use for statutory accounts. The treatment group for the difference-in-difference analyses is selected as: 1) those countries that have adopted IFRS, and that 2) have either an independent or quasi-dependent tax regime. Furthermore, for those countries classified as a quasi-dependent tax regime, I require 3) that IFRS be not permitted for statutory accounting purposes. These requirements leave 11 countries that adopt IFRS for financial purposes but have no change in either the tax regime or the accounting for statutory accounts.[14]

In addition, Table 15 provides the change in both the corporate statutory tax rate and the personal statutory tax rate for all countries which adopted IFRS for the three years

[13]Per *IFRS adoption by country*, there are three types of tax regimes: dependent, quasi-dependent, and independent. A dependent tax regime refers to those countries where taxable profit is based on the legal-entity statutory accounts with only limited deductions. Quasi-dependent refers to those countries where taxable profit is principally based on the legal entity statutory accounts with a number of adjustments provided in the tax law. Independent refers to those countries where taxable profit is determined in accordance with a specific set of tax rules with little or no direct reliance on the legal entity statutory accounts of the company.

[14]Of note here is that some firms and countries had concerns prior to IFRS convergence on the potential direct impact such convergence might have on firms' tax liabilities. For example, in 2008, subsequent to adopting IFRS for financial purposes, Spain shifted to a modified Spanish GAAP for tax purposes but passed legislation around the same time in an attempt to ensure that firm-level tax liabilities would not change pre- and post-change. The results of the tests presented here imply that even despite the efforts of such legislation, there may still be an indirect effect on tax avoidance as firms are less able to hide tax avoidance strategies in the more transparent environment.

surrounding IFRS adoption. As is seen there, the adoption to IFRS for most countries did not also include include a change in the tax rate, with only two of the eleven treatment countries having any noticeable change in the CSTR from the year immediately prior IFRS adoption to the year of IFRS adoption. Of these two, Austria experience the greatest change by lowering its CSTR by 9 percentage points. Denmark was the second country and lowered its rate by 2 percentage points. These findings further reinforces the belief that for these countries the adoption of IFRS did not include a change in tax regime.

To test the direction of the association, I perform pooled OLS regressions of the following form:

$$TaxAvoid_{i,t} = \gamma_0 + \gamma_1 Adopter_{i,t} + \gamma_2 PostYears_{i,t} + \gamma_3 Adopter_{i,t} * PostYears_{i,t} + \beta_1 Controls_{i,t} + Fixed\,Effects + \varepsilon_{i,t} \quad (2)$$

where *Adopter* takes a value of one for firms domiciled in one of the 11 countries chosen according to the three criteria above and zero otherwise. *PostYears* takes a value of one for all fiscal years ending after the IFRS adoption date, December 31, 2005, and zero otherwise.[15] Due to *Adopter* and *PostYears* both being linear combinations of country or year fixed effects, respectively, the model above is also restricted to include only the interaction term. To the extent that tax avoidance follows opacity, tax avoidance will be reduced post-IFRS adoption for the sample of firms in those 11 countries relative to tax avoidance both pre-adoption and for those firms domiciled in other countries. However, to the extent that the direction of the association runs opposite and that opacity leads tax avoidance, there will be no such effect on tax avoidance. The variable of interest that captures this effect is γ_3. A coefficient on γ_3 different from zero is interpreted as signifying that opacity has a differing impact on

[15] I focus only on the December 31, 2005, IFRS adoption period and exclude the January 1, 2008, IFRS adoption by Israeli firms for the following reasons: first, only a handful of Israeli firms are represented at the later date; and second, due to the sample period only extending to 2008, I am unable to do a full post-IFRS analysis for the Israeli firms that adopted IFRS at the later date.

tax avoidance for the 11 countries identified as IFRS adopters but not tax regime changers after IFRS adoption versus tax avoidance before IFRS adoption and for other countries. Specifically, I expect a negative sign on γ_3 when using *CETRSpr* as the dependent variable. Due to the exogenous nature of IFRS adoption without tax regime changes, this implies that opacity leads tax avoidance.

The results of this test can be found in Table 7. Columns (1) and (3) of Table 7 report results where the dependent variable is *CETRSpr*, and Columns (2) and (4) report results where the dependent variable is *CETRSca* for robustness. In all models the interaction term γ_3 is significant and in the expected direction (i.e., -0.042 and -0.043 for models where the dependent variable is *CETRSpr* and 0.118 and 0.121 for those using *CETRSca*), suggesting that increased tax avoidance does indeed follow from increased opacity. In addition, neither *Adopter* nor *PostYears* is significantly different from zero on its own. This suggests that the reduction in tax avoidance is not due to some inherent country- or time-related characteristic but is because of the shock to opacity experienced by these 11 countries post-IFRS adoption. In addition, Table 7, Columns (5) through (8) report robustness results of these tests. Columns (5) and (6) report results using a random selection of 11 countries as IFRS adopters that did not also change tax regimes while Columns (7) and (8) report results using a randomly selected year as the mandatory IFRS adoption year. Due to IFRS adoption occuring at a single time for the countries in the sample, these additional tests help to ensure that the results are not spurious. As is seen in Columns (5) through (8), γ_3 is insignificantly different from zero in all four specifications, lending further support to the argument that the adoption of IFRS for the 11 countries identified in Table 6 was a shock to opacity and that this shock led to a reduction in tax avoidance.

As is seen in Table 1, the U.S. is a large part of the sample. Since US GAAP is generally of higher quality than the local GAAPs found in other countries (Leuz and Verrecchia 2000), the inclusion of U.S. firms in the control sample in the above tests may be inducing a bias in the results of those tests. Therefore, to ensure the robustness of the results, I next exclude the

U.S. from the control group. As is seen in Table 7, Columns (9) and (10), the results continue to be very statistically significant, with the coefficients on the interaction terms continuing in the desired directions (-0.055 and 0.155 for *CETRSpr* and *CETRSca*, respectively) and both significant at the 5-percent level. These results reinforce those found above and further strengthen the causal argument.

To further test the association, I use a difference-in-difference design for the one year immediately before and after IFRS adoption and interact the firm-level summary opacity measure, *OScore*, with the interaction of *PostYears* and *Adopter* (termed *PostAdopter*) where *PostAdopter* is again equal to one for those firms in the 11 countries that have adopted IFRS but had no change to the tax regime in the year after IFRS adoption and equal to zero otherwise. This test is performed to determine whether the association between opacity and tax avoidance changes post-IFRS adoption for those 11 countries in the treatment sample. Limiting the analysis to the years immediately before and after adoption focuses on the effect that IFRS adoption has on the ability of firms to use opacity for tax avoidance. As is seen in Table 8, Columns (1) and (2), the coefficient on *OScore* remains significant and in the expected direction with a value of 0.025 for *CETRSpr* and -0.071 for *CETRSca*. This implies that opacity continues to be positively associated with tax avoidance for all firms during those years. Of particular importance, however, is the interaction term between *OScore* and *PostAdopter*, which is significant at the 1 percent level with a coefficient of -0.017 and 0.051 for *CETRSpr* and *CETRSca*, respectively. This differential effect pre- and post-IFRS adoption implies that the ability of the firms in those 11 countries to use opacity to avoid taxes is attenuated by the exogenous shock to opacity of IFRS adoption and bolsters the claim that tax avoidance follows financial opacity. Lastly, but also of interest, is the coefficient on *PostAdopter*, which is not significant. This is consistent with the reduction in tax avoidance occurring due to the decrease in opacity and not through some alternative channel related to other changes that might have occurred at the time of IFRS adoption. This is expected, as the firms located in countries that could opportunistically change their tax regime to reduce

taxes paid at the time of IFRS adoption are excluded from the treatment group. This is in contrast to Ng (2009) that uses a sample of firms in the United Kingdom, where firms were able to choose whether to change their statutory accounts over to IFRS, to show that firms that are able to choose to change their tax regime did so due to accounting regulation differences that resulted in the firm paying less in taxes. Indeed, as seen in Table 8, Column (3), where *PostAdopter* is changed to *PostIFRS* and now includes all countries that adopted IFRS after IFRS adoption (and thus includes countries where firms can opportunistically choose their tax regime), the coefficient on *PostIFRS* is positive and significant, reinforcing the findings of Ng (2009) that firms that are permitted to change their tax regime to IFRS may do so to gain a tax advantage.

As a second exogenous shock that has an impact on the information environment of a firm, I use the initial enforcement of newly introduced insider trading laws. Bhattacharya and Daouk (2002) show that the first prosecution of insider trading laws have an impact on capital market participants and result in lower costs of equity for the country. Consistent with this, evidence suggests that analyst following increases, analysts forecast a broader set of measures, and that financial reporting quality improves upon the restriction of insider trading (see Bushman et al. 2005, Hail 2007, and Zhang and Zhang 2012). In addition, Hail et al. 2012 show that firms rely less on dividends as a means of signaling their type following the information environment improvement associated with a country's enforcement of insider trading laws. Thus, the initial enforcement of insider trading laws, in addition to IFRS adoption, is associated with improvement to the information environment and, as a country-level event, is largely exogenous from the individual firm.

Table 9 shows the results of the tests using the initial enforcement of insider trading laws. Since the enforcement of insider trading laws had no broader financial accounting ramifications, the tests here use both the cash effective and reported tax rate spreads and ratios as dependent variables. In addition, since the initial enforcement of insider trading laws should have no direct impact on the reported tax expense or cash taxes paid by a firm,

I don't need to limit the treatment group as I did for the tests using the adoption of IFRS. Therefore, the variable *IT Enforcement* takes a value equal to one for every year after the first year that insider trading laws were enforced for each country that enforced insider trading laws. As is seen in each of the Columns (1) through (4), the coefficient on *IT Enforcement* is significant and in the expected direction, implying that tax avoidance decreased for the firm following the enforcement of insider trading laws in the country where it was domiciled relative to tax avoidance before enforcement and for countries with no enforcement. These findings help and strengthen the earlier findings in regard to IFRS adoption as an exogenous shock and bolster the claim that opacity leads tax avoidance.

As an additional test, I also perform a simple lead/lag analysis using lags of both opacity and tax avoidance. The results of this analysis are shown in Table 13, Columns (1) and (2). As is shown in that table, lagged opacity continues to be significantly and positively associated with current tax avoidance (coefficient of 0.019 and significant at the 1-percent level), whereas lagged tax avoidance loses all association with current opacity. In whole, the above tests and their results bolster the claim that the direction of the association between firm-level opacity and tax avoidance is indeed one where opacity leads tax avoidance.

4.2.4 Rent extraction, opacity, and tax avoidance

The next set of tests turns to the third hypothesis, that financial opacity provides a compelling setting in which the activities of rent extraction and tax avoidance may occur. These tests look at managerial opportunistic behaviors. The results of these test are shown in Table 10, Columns (1) through (4).

To capture the opportunities for private benefits extraction, I construct both a firm- and country-level proxy. Following Amiram and Owens (2011), private benefits extraction is defined broadly to include activities such as empire building, rent extraction, and expropriation.[16] For a firm-level measure I use the percentage of closely-held shares of the corporation

[16]The conceptualization of private benefits is summarized in Tirole (2001) as "[Insiders] may collect private benefits by building empires, enjoying perks, or even stealing from the firm by raiding its pension fund, by

and define an indicator variable, $PBOpp\_F$, that is equal to one if the firm has a percentage of such shares above the sample median and zero otherwise. Additionally, for a country-level measure I rely upon the anti-self dealing index as supplied by Djankov et al. (2008) and construct a second indicator variable, $PBOpp\_C$, that is equal to one if the anti-self dealing index for the country is in the bottom quartile of all countries, and zero otherwise. Using these measures, I then estimate pooled OLS regression models of the following form:

$$TaxAvoid_{i,t} = \gamma_0 + \gamma_1 Opacity_{i,t} + \gamma_2 PBOpp_{i,t} + \gamma_3 PBOpp_{i,t} * Opacity_{i,t} + \beta_1 Controls_{i,t} + Fixed\,Effects + \varepsilon_{i,t} \quad (3)$$

where *PBOpp* captures either the firm- or country-level opportunities for the extraction of private benefits ($PBOpp\_F$ and $PBOpp\_C$, respectively) as measured above and *Opacity* is measured by the firm-level summary opacity measure, *OScore*.

As is seen in Table 10, Columns (1) and (2), *OScore* continues to remain significant and in the expected direction (positive for *CETRSpr* and negative for *CETRSca*). Of particular note, though, is the coefficients on the indicator variable for $PBOpp\_F$ and the interaction effect between opacity and opportunities for private benefit extraction. The coefficient on the indicator variable is -0.034 and is significant at the 1 percent level. This finding is interesting because it implies that as opportunities for private benefits extraction increase, tax avoidance actually decreases. This effect, however, is attenuated by the interaction effect which shows a significant coefficient of 0.009, implying that increased tax avoidance is associated with increased opacity and an increase in opportunities for benefits extraction.

Although less strong, the results of Columns (3) and (4) also provide evidence on the interaction between rent extraction, opacity, and tax avoidance. While the coefficients on

paying inflated transfer prices to affiliated entities, or by engaging in insider trading. Last, they may entrench themselves by investing in mature or declining industries that they are good at running, by taking risk that is either excessive (as when their position is endangered) or insufficient (as when it is secure), or by bending over backwards to resist a takeover."

the indicator variable alone lose significance, the interaction effect in both models remains significant and in the predicted direction. This finding bolsters the earlier, firm-level findings. In summary, the findings of Table 10 extends the theory of Desai and Dharmapala (2006) by showing that opacity is an important factor when considering the association between tax avoidance and rent extraction.

4.2.5 Collected tax revenues

This final analysis tests the association between country-level opacity and aggregate tax avoidance. Analyses at the aggregate have the advantage of being less prone to potential issues involving endogeneity. In addition, an analysis in the aggregate helps to move past the potential firm-level data limitations by testing whether the relationship between opacity and tax avoidance holds for all corporations within a country instead of for only the sample of those public firms covered by *Worldscope*, *I/B/E/S*, etc.

The variable used for aggregate tax avoidance is *CTaxRevGDP*, and is defined as the corporate tax revenues collected by a country as a percentage of its GDP. The requisite data for *CTaxRevGDP* is collected from the OECD website and smaller (larger) values are interpreted to mean that firms avoid more (less) taxes in the aggregate. In addition, I follow Atwood et al. (2011) and include the following country-level variables that are likely to affect tax revenues as collected by central governments: the enacted corporate statutory tax rate, *CSTR*; the presence of a worldwide taxation system, *Worldwide*; book-tax conformity, *BookTaxConf*; country-level earnings volatility, *EarnVol*; the civil versus common law, *CivCom*; anti-director shareholder rights, *AntiDirRights*; and ownership concentration, *OwnCon*. In addition, I also include the country-level opportunities for the extraction of private benefits from the pervious analysis, *PBOpp_C*, as a measure of management opportunity and incentives for tax avoidance. Similar to Amiram and Owens (2011), I assume that an environment with high (low) opportunities for extraction is characterized by light (severe) punishment if

the manager is caught extracting private benefits. All control variables are defined in the Appendix.

Results of this test can be found in Table 11. All four country-level opacity measures continue to load in the expected direction (i.e., higher levels of transparency relate to more corporate tax revenues collected). However, only three of the variables are statistically significant (*MediaPen* has a coefficient of 0.029 but a *t-stat* of only 1.26). Of particular note is the significant and positive coefficient on *PostIFRS* (set equal to one for years post adoption for those countries that mandated the use of IFRS, zero otherwise), which shows that countries that have enacted IFRS collect, on average, more in tax revenues taken as a percentage of GDP than do other nations. This bolsters the earlier tests and findings concerning the effect of IFRS on tax avoidance and in particular, the directional effect of opacity on avoidance.

As a final test, I include a new variable, *Imput*, which is set equal to one for country-years where a full imputation system was in place and zero otherwise. Under a full imputation system, shareholders receive credits for the amount of corporate taxes that the corporation pays, thus eliminating the double taxation of corporate earnings. The result of this is that corporate tax avoidance under an imputation system simply shifts the burden to the shareholders; it does not reduce the overall tax burden. The positive coefficient on *Imput* shows that countries with imputation system collect more in tax revenues, implying that firms have less incentive to avoid taxes in those jurisdictions. This finding supports the findings of Amiram et al. (2011).

The significance of the control variables varies across each model, but in general, higher collected corporate tax revenues are associated with countries with higher book-tax conformity, worldwide taxation systems, lower earnings volatility, and a low (high) threat of private benefits extraction (punishment). These findings are consistent with Atwood et al. (2011), though with some conflicting evidence in regard to the corporate statutory tax rate.

Intuition might dictate that as the corporate tax rate increases, so too would tax revenues - however, so too do management incentives to avoid taxes (see Desai et al. 2007).

4.2.6 Firm-level robustness

Lastly, I evaluate the robustness of the association between opacity and tax avoidance against alternative specifications of tax avoidance. The results of these tests are presented in Table 12.

As described above, the first measure used to evaluate the robustness of the main results is the ratio of the cash ETR or reported ETR to the applicable corporate statutory rate (similar to Amiram et al. 2011). Along with the tax rate spread, tax rate ratios help control for unseen time-varying country-level characteristics by being benchmarked against the CSTR. In contrast to the tax rate spreads, however, greater tax rate ratios imply a lower degree of tax avoidance. As seen in Table 12, Columns (1), (3), (4), and (6), *OScore* is significantly and negatively associated with each tax rate ratio. In support of the earlier findings, this implies that opacity is positively associated with tax avoidance.

The measures of tax avoidance used in this study thus far have been calculated to adjust for the effect of special and extraordinary items, though this adjustment is often not performed in the literature. Thus, as another robustness measure calculates, I the cash ETR and reported ETR as the ratio of cash taxes paid and tax expense, respectively, to pre-tax income without any adjustments. Regression models that use this second alternative include Table 12, Columns (2), (3), (5), and (6). As is seen, the results in Columns (2) and (3) continue to be highly significant and in the expected direction, though the results in Columns (5) and (6) are slightly attenuated with Column (6) being insignificantly different from zero. These weaker results when using measures based upon the reported ETR are consistent with the earlier findings in Table 4. Given that Column (6) is the only specification that loses significance, the results appear to be robust to alternative measurements.

As mentioned earlier, the use of rate spreads and ratios is relatively new to the literature, so as an additional robustness check I use the cash ETR and reported ETR without first differencing or scaling by the corporate statutory tax rate. Similar to the tax rate ratios, greater unadjusted rates are interpreted to imply a lower degree of tax avoidance. In addition, I estimate a model of these unadjusted rates that also includes the country-level statutory rate as an additional control. This alternative specification continues to control for the country-level statutory rate but allows the coefficient on *CSTR* to take a value different than one. Regression models that use these unadjusted rates can be found in Table 12, Columns (7), (8), (9), and (10). Again, the results of these tests show no qualitative difference to the original results.

Next, I perform a series of additional robustness tests. First, as seen in Table 1, U.S. firms outnumber firms of any other country, which may be inducing a bias in the results. Therefore, I test all main firm-level results while excluding the U.S. from the sample. The results of this test can be found in Table 14, Panels A and B. Similar to the results found in Table 3 which include the U.S., the results for models that use the reported ETR spread are generally weaker than the results which use the cash ETR spread. In fact, as shown in Panel A, all five proxies for opacity continue to load positively and significantly (with *DiscAcc* and *OScore* significant at the 1-percent level, all others at the 5-percent level). As discussed above and seen in Table 7, Columns (9) and (10), the results of the tests for causalty are also robust to the exclusion of the U.S. from the sample.

Finally, the results are also robust to: 1) estimating yearly, cross-sectional models as performed in Fama and MacBeth (1973), 2) excluding the bid-ask spread from the firm-level summary opacity measure, *OScore*, 3) measuring *OScore* as the principal components of a principal component analysis of the four proxies for opacity, and 4) measuring *OScore* as the principal components of a principal component analysis of the three proxies excluding the bid-ask spread.[17] The results of each of these robustness tests can be seen in Table 13,

[17]Due to the bid-ask spread being more market-driven, it is excluded from both *OScore* and the principal component analysis to focus more on financial statement information opacity.

Columns (3) through (6), respectively. All coefficients of interest for these additional tests are positive (ranging from 0.012 and 0.018) and significant at the 1-percent level.

5 Conclusion

While the prior literature has shown that tax-related information has information content for investors and market participants in regard to firm-level earnings growth, earnings persistence, earnings quality, and earnings management, it has shown little in regard to the effect that financial reporting information and market intermediaries have upon the tax-related activities of the firm. In addition, less is known about the potential real effects that opacity may have upon tax avoidance behaviors. Using cross-country data, I find evidence consistent with opaque firms engaging in more tax avoidance. As can be reasonably expected, this effect is even more pronounced for firms located in countries with weaker governance and lower levels of disclosure, and when other channels of acquiring corporate-level information are restricted. These results hold for a broad range of tax avoidance proxies and in many alternative specifications.

In difference-in-difference analyses using the mandatory adoption of IFRS while controlling for tax regime changes around the time of adoption, I find direct evidence consistent with a causal relationship between opacity and tax avoidance, namely that opacity leads tax avoidance. Additional tests using of the enforcement of insider trading laws as a second exogenous shock to the information environment provide additional support that opacity leads tax avoidance. I also find evidence that opaque firms with opportunities to extract private benefits engage in increased levels of tax avoidance. These finding hold using proxies for both firm- and country-level opportunities for private benefit extraction. Lastly, I present evidence in the aggregate that country-level collected tax revenues are negatively associated with country-level opacity. Together these findings contribute to a more complete understanding of the real effects of opacity on tax avoidance and suggest that previous models of

tax avoidance may be omitting an important variable from consideration. In addition, the market frictions and costs related to opacity and the tension between opacity and book-tax congruence may help to explain the puzzle in the literature of why some firms appear to engage in more conservative tax planning than might otherwise appear optimal.

The findings of this study raise questions for additional areas of inquiry and further research. Particularly, the strong association between analyst measures and tax avoidance imply that analysts may not fully understand the complexities of taxation and that opacity can further compound to hinder the analyst's ability to accurately capture tax-related information in the forecast of earnings. Further research will be needed to determine the extent of this potential bias and under what circumstances analysts do or do not fully impound the effect of tax into their forecasts. In addition, the results of H3 suggest that opacity is an important link between tax avoidance and rent extraction, though additional work is left to future research.

References

Amiram, D., Bauer, A. M., Frank, M. M., 2011. The effect of the shareholder dividend tax policy on corporate tax avoidance, Working paper.

Amiram, D., Owens, E., 2011. Private benefits extraction and the opposing effects of income smoothing on private debt contracts, Working paper.

Anderson, R., Duru, A., Reeb, D., 2009. Founders, heirs, and corporate opacity in the U.S. Journal of Financial Economics 92, 205–222.

Armstrong, C. S., Blouin, J. L., Larcker, D. F., 2012. The incentives for tax planning. Journal of Accounting and Economics 53, 391–411.

Atwood, T., Drake, M. S., Myers, J. N., Myers, L. A., 2011. Home country tax system characteristics and corporate tax avoidance: International evidence, Working paper.

Atwood, T., Drake, M. S., Myers, L. A., 2010. Book-tax conformity, earnings persistence and the association between earnings and future cash flows. Journal of Accounting and Economics 50, 111–125.

Bae, K.-H., Tan, H., Welker, M., 2008. International GAAP differences: The impact on foreign analysts. The Accounting Review 83, 593–628.

Balakrishnan, K., Blouin, J., Guay, W., 2011. Does tax aggressiveness reduce financial reporting transparency?, Working paper.

Bauer, A., 2011. Internal control quality as an explanatory factor of tax avoidance, Working paper.

Becker, C., DeFond, M. L., Jiambalvo, J., Subramanyam, K., 1998. The effect of audit quality on earnings management. Contemporary Accounting Research 15, 1–24.

Bhattacharya, U., Daouk, H., 2002. The world price of insider trading. The Journal of Finance 57, 75–108.

Bhattacharya, U., Daouk, H., Welker, M., 2003. The world price of earnings opacity. The Accounting Review 78, 641–678.

Bushman, R. M., Chen, Q., Engel, E., Smith, A. J., 2004a. Financial accounting information, organizational complexity, and corporate governance systems. Journal of Accounting and Economics 37, 167–201.

Bushman, R. M., Piotroski, J., Smith, A. J., 2004b. What determines corporate transparency? Journal of Accounting Research 42, 207–252.

Bushman, R. M., Piotroski, J., Smith, A. J., 2005. Insider trading restrictions and analysts' incentives to follow firms. The Journal of Finance 60, 35–66.

Bushman, R. M., Smith, A. J., 2001. Financial accounting information and corporate governance. Journal of Accounting and Economics 32, 237–333.

Byard, D., Li, Y., Yu, Y., 2011. The effect of mandatory IFRS adoption on financial analysts' information environment. Journal of Accounting Research 49, 69–96.

Chen, S., Chen, X., Cheng, Q., Shevlin, T. J., 2010. Are family firms more tax aggressive than non-family firms? Journal of Financial Economics 95, 41–61.

Christensen, H. B., Hail, L., Leuz, C., 2012. Mandatory IFRS reporting and changes in enforcement, Working paper.

Crocker, K. J., Slemrod, J., 2005. Corporate tax evasion with agency costs. Journal of Public Economics 89, 1593–1610.

Daske, H., Hail, L., Leuz, C., Verdi, R. S., 2008. Mandatory IFRS reporting around the world: Early evidence on the economic consequences. Journal of Accounting Research 46, 1085–1142.

Dechow, P. M., Sloan, R. G., Sweeney, A. P., 1995. Detecting earnings management. The Accounting Review 70, 193–225.

DeFond, M. L., Jiambalvo, J., 1993. Factors related to auditor-client disagreements over income-increasing accounting methods. Contemporary Accounting Research 9, 415–431.

Desai, M. A., Dharmapala, D., 2006. Corporate tax avoidance and high-powered incentives. Journal of Financial Economics 79, 145–179.

Desai, M. A., Dharmapala, D., 2009. Corporate tax avoidance and firm value. The Review of Economics and Statistics 91, 537–546.

Desai, M. A., Dyck, A., Zingales, L., 2007. Theft and taxes. Journal of Financial Economics 84, 591–623.

Diamond, D. W., Verrecchia, R. E., 1991. Disclosure, liquidity, and the cost of capital. The Journal of Finance 46, 1325–1359.

Ding, Y., Hope, O.-K., Jeanjean, T., Stolowy, H., 2007. Differences between domestic accounting standards and IAS: Measurement, determinants and implications. Journal of Accounting and Public Policy 26, 1–38.

Djankov, S., La Porta, R., de Silanes, F. L., Shleifer, A., 2008. The law and economics of self-dealing. Journal of Financial Economics 88, 430–465.

Drucker, J., October 21, 2010. Google 2.4 percent rate shows how 60 billion lost to tax loopholes. Bloomberg.
URL `www.bloomberg.com`

Dyreng, S. D., Hanlon, M., Maydew, E. L., 2008. Long-run corporate tax avoidance. The Accounting Review 83, 61–82.

Dyreng, S. D., Hanlon, M., Maydew, E. L., 2010. The effects of executives on corporate tax avoidance. The Accounting Review 85, 1163–1189.

Dyreng, S. D., Lindsey, B. P., 2009. Using financial accounting data to examine the effect of foreign operations located in tax havens and other countries on US multinational firms' tax rates. Journal of Accounting Research 47, 1283–1316.

Ellul, A., Jappelli, T., Pagano, M., Panunzi, F., 2010. Accounting transparency, tax pressure and access to finance, Working paper.

European Commission, 2005. Planned implementation of the IAS Regulation (1606/2002) in the EU and EEA. Electronic.

Fama, E. F., MacBeth, J., 1973. Risk, return and equilibrium: Empirical tests. Journal of Political Economy 81, 607–636.

Francis, J., LaFond, R., Olsson, P. M., Schipper, K., 2004. Costs of equity and earnings attributes. The Accounting Review 79, 967–1010.

Francis, J., LaFond, R., Olsson, P. M., Schipper, K., 2005. The market pricing of accruals quality. Journal of Accounting and Economics 39, 295–327.

Frank, M. M., Lynch, L. J., Rego, S. O., 2009. Tax reporting aggressiveness and its relation to aggressive financial reporting. The Accounting Review 84, 467–496.

Gow, I. D., Ormazabal, G., Taylor, D., 2010. Correcting for cross-sectional and time-series dependence in accounting research. The Accounting Review 85, 483–512.

Gupta, S., Newberry, K., 1997. Determinants of the variability in corporate effective tax rates: Evidence from longitudinal data. Journal of Accounting and Public Policy 16, 1–34.

Hail, L., 2007. Discussion of investor protection and analysts' cash flow forecasts around the world. Review of Accounting Studies 12, 421–441.

Hail, L., Leuz, C., 2009. Capital market effects of mandatory IFRS reporting in the EU: Empirical evidence, Working paper.

Hail, L., Tahoun, A., Wang, C., 2012. Dividend signaling and information shocks, Working paper.

Hanlon, M., 2003. What can we infer about a firm's taxable income from its financial statements? National Tax Journal 56, 831–863.

Hanlon, M., 2005. The persistence and pricing of earnings, accruals, and cash flows when firms have large book-tax differences. The Accounting Review 80, 137–166.

Hanlon, M., Heitzman, S., 2010a. A review of tax research. Journal of Accounting and Economics 50, 127–178.

Hanlon, M., Heitzman, S., 2010b. Tax research: Real effects, reporting effects, and governance, Working paper.

Hanlon, M., LaPlante, S. K., Shevlin, T., 2005. Evidence on the information loss of conforming book income and taxable income. The Journal of Law and Economics 48, 407–442.

Hanlon, M., Slemrod, J., 2009. What does tax aggressiveness signal? Evidence from stock price reactions to news about tax shelter involvement. Journal of Public Economics 93, 126–141.

Hines, J. R., Rice, E. M., 1994. Fiscal paradise: Foreign tax havens and American business. Quarterly Journal of Economics 109, 149–182.

Hope, O.-K., Ma, S., Thomas, W. B., 2011. Tax avoidance and geographic earnings disclosure, Working paper.

Jin, L., Myers, S. C., 2006. R-squared around the world: New theory and new tests. Journal of Financial Economics 79, 257–292.

Kothari, S., Leone, A. J., Wasley, C. E., 2005. Performance matched discretionary accrual measures. Journal of Accounting and Economics 39, 163–197.

La Porta, R., de Silanes, F. L., Shleifer, A., 1998. Law and finance. Journal of Political Economy 106, 1113–1155.

La Porta, R., de Silanes, F. L., Shleifer, A., 2006. What works in securities laws? The Journal of Finance 61, 1–32.

La Porta, R., de Silanes, F. L., Shleifer, A., Vishny, R. W., 1997. Legal determinants of external finance. The Journal of Finance 52, 1131–1150.

Landsman, W. R., Maydew, E. L., Thornock, J. R., 2012. The information content of annual earnings announcements and mandatory adoption of IFRS. Journal of Accounting and Economics 53, 34–54.

Lang, M. H., Lins, K. V., Maffett, M. G., 2011. Transparency, liquidity, and valuation: International evidence on when transparency matters most, Forthcoming in Journal of Accounting Research.

Lang, M. H., Lins, K. V., Miller, D. P., 2003. ADRs, analyst, and accuracy: Does cross listing in the United States improve a firm's information environment and increase market value? Journal of Accounting Research 41, 317–345.

Lang, M. H., Lins, K. V., Miller, D. P., 2004. Concentrated control, analyst following, and valuation: Do analyst matter most when investors are least protected? Journal of Accounting Research 42, 589–623.

Lang, M. H., Lundholm, R. J., 1996. Corporate disclosure policy and analyst behavior. The Accounting Review 71, 467–492.

Lang, M. H., Maffett, M. G., Owens, E., 2010. Earnings comovement and accounting comparability: The effects of mandatory IFRS adoption, Working paper.

Leuz, C., Verrecchia, R. E., 2000. The economic consequences of increased disclosure. Journal of Accounting Research 38, 353–386.

Lev, B., Nissim, D., 2004. Taxable income, future earnings, and equity values. The Accounting Review 79, 1039–1074.

Maffett, M. G., 2011. Who benefits from corporate opacity? International evidence from informed trading by institutional investors, Working paper.

McNichols, M. F., Stubben, S. R., 2008. Does earnings management affect firms' investment decisions? The Accounting Review 83, 1571–1603.

Ng, J., 2009. Tax and non-tax incentives for voluntary IFRS adoption: Evidence from the UK, Working paper.

PricewaterhouseCoopers LLP, 2009. IFRS adoption by country.

PricewaterhouseCoopers LLP, 2011. IFRS adoption by country.

Rego, S. O., 2003. Tax-avoidance activities of U.S. multinational corporations. Contemporary Accounting Research 20, 805–833.

Rego, S. O., Wilson, R., 2008. Executive compensation, tax reporting aggressiveness, and future firm performance, Working paper.

Rego, S. O., Wilson, R., 2011. Equity risk incentives and corporate tax aggressiveness, Working paper.

Scholes, M. S., Wolfson, M. A., Erickson, M., Maydew, E. L., Shevlin, T., 2009. Taxes and business strategy: A planning approach, Fourth Edition. Pearson Prentice Hall.

Shackelford, D. A., Shevlin, T., 2001. Empirical tax research in accounting. Journal of Accounting and Economics 31, 321–387.

Slemrod, J., 2004. The economics of corporate tax selfishness. National Tax Journal 4, 877–899.

Sloan, R. G., 1996. Do stock prices fully reflect information in accruals and cash flows about future earnings? The Accounting Review 71, 289–315.

Tax Justice Network, November 2011. The cost of tax abuse: A briefing paper on the cost of tax evasion worldwide. Online.

Teoh, S. H., Wang, T., 1993. Perceived auditor quality and the earnings response coefficient. The Accounting Review 68, 346–366.

Tirole, J., 2001. Corporate governance. Econometrica 69, 1–35.

U.S. GAO, October 21, 2003. Challenges remain in combating abusive tax shelters. In: Testimony before the Committee on Finance, U.S. Senate. U.S. General Accounting Office, Washington D.C.

Wang, X., 2010. Tax avoidance, corporate transparency, and firm value, Working paper.

Wilson, R., 2009. An examination of corporate tax shelter participants. The Accounting Review 83, 519–548.

Yu, F., 2008. Analyst coverage and earnings management. Journal of Financial Economics 88, 245–271.

Zhang, I., Zhang, Y., 2012. Insider trading restrictions and insiders' supply of information: Evidence from reporting quality, Working paper.

Zimmerman, J. J., 1983. Taxes and firm size. Journal of Accounting and Economics 5, 119–149.

Appendix: Variable Definitions

Variable Name	Variable Definition and Data Source
Dependent Variables	
CETR	Cash Effective Tax Rate: Calculated as taxes paid (WC04150) divided by [pre-tax income (WC01401) less discontinued operations (WC04054) & extraordinary items (WC04225)]. Set to missing if denominator is less than or equal to zero. Source: Worldscope/Datastream.
ETR	Reported Effective Tax Rate: Calculated as the total income taxes (WC01451) divided by [pre-tax income (WC01401) less discontinued operations (WC04054) & extraordinary items (WC04225)]. Set to missing if denominator is less than or equal to zero. Source: Worldscope/Datastream.
CSTR	Combined Corporate Statutory Tax Rate: Calculated as reported by source. Includes both central and applicable sub-central government tax rates. Source: www.oecd.org and hand-collected.
CETRSpr	Cash Effective Tax Rate Spread: Calculated as the difference between the applicable *CSTR* for the firm and its *CETR*.
CETRSca	Cash Effective Tax Rate Scaled: Calculated as the ratio of the firm's *CETR* and the applicable *CSTR*.
ETRSpr	Effective Tax Rate Spread: Calculated as the difference between the applicable *CSTR* for the firm and its *ETR*.
ETRSca	Effective Tax Rate Scaled: Calculated as the ratio of the firm's *ETR* and the applicable *CSTR*.
CETR2Spr	Alternative measure of *CETRSpr*: Calculated as the difference between the applicable *CSTR* for the firm and an alternative measure of *CETR*, calculated as taxes paid (WC04150) divided by [pre-tax income (WC01401).
CETR2Sca	Alternative measure of *CETRSca*: Calculated as the ratio of the firm's alternative measure of *CETR* [calculated as taxes paid (WC04150) divided by [pre-tax income (WC01401)] and the applicable *CSTR*.
ETR2Spr	Alternative measure of *ETRSpr*: Calculated as the difference between the applicable *CSTR* for the firm and an alternative measure of *ETR*, calculated as total income taxes (WC01451) divided by [pre-tax income (WC01401).
ETR2Sca	Alternative measure of *ETRSca*: Calculated as the ratio of the firm's alternative measure of *ETR* [calculated as total income taxes (WC01451) divided by [pre-tax income (WC01401)] and the applicable *CSTR*.

CTaxRevGDP	Country-level variable for government collected tax revenues as a percentage of Gross Domestic Product (GDP). According to www.oecd.org, the ratios are calculated by expressing total corporate tax revenues as a percentage of GDP at market prices. Source: www.oecd.org.

Experimental Variables - Firm

ForErr	Analysts' Forecast Error: Calculated as the absolute value of the mean analyst forecast from I/B/E/S less the actual earnings as reported in the I/B/E/S Summary file divided by the market price (Datastream item P) at the end of the previous fiscal year. Source: Worldscope/Datastream and I/B/E/S.
ForDisp	Analysts' Forecast Dispersion: Calculated as the dispersion in forecasts immediately before the end of the fiscal year from I/B/E/S divided by the market price (Datasteam item P) at the end of previous year. Source: Worldscope/Datastream and I/B/E/S.
DiscAcc	Discretionary Accruals: Performance-matched modified-Jones model discretionary accruals calculated following Kothari et al. (2005) and Frank et al. (2009). Source: Worldscope/Datastream.
BidAskSpr	Average Bid-Ask Spread: Calculated as the log of the average of the daily bid-ask spread for the fiscal year. The daily bid-ask spread is calculated as the asking price (Datastream item PA) less the bid price (Datastream item PB) divided by the midway-point between the two. Source: Worldscope/Datastream.
OScore	Opacity Score: Calculated from the four opacity measures of ForErr, ForDisp, DiscAcc, and BidAskSpr. The OScore for a firm increases by one for each of the four measures that is above the sample median and thus ranges between 0 and 4.
PBOpp_F	Firm-level opportunities of private benefits extraction: An indicator variable set equal to one if the firm's percentage of closely held shares (WC05475) as a percentage of ordinary shares outstanding (NOSH) is greater than the sample median, and zero otherwise. Source: Worldscope/Datastream.

Experimental Variables - Country

Governance	Country-level index variable for governance as reported in Bushman et al. (2004b). Higher scores correspond to better governance and greater transparency.
Disclosure	Country-level index variable for disclosure as reported in La Porta et al. (2006) and Bushman et al. (2004b). Higher scores correspond to better disclosure and greater transparency.

MediaPen	Country-level index variable for media penetration as reported in Bushman et al. (2004b) and Maffett (2011). Constructed using World Bank's World Development Indicators, in which each country is ranked based on the number of newspapers, internet connections, and televisions per capita. Higher scores correspond to better media penetration and greater transparency.
PostIFRS	Country-level indicator variable equal to one if the country mandates the use of IFRS during the year, and zero otherwise.
PostAdopter	Country-level indicator variable equal to one if the country is one of 11 that mandates the use of IFRS during the year but keeps its tax regime unchanged, and zero otherwise. Also the interaction between *PostYears* and *Adopter*. Criteria used is to select the countries as *Adopter* are: 1) those countries that mandate the adoption of IFRS and that 2) have either an independent or quasi-dependent tax regime. Furthermore, for those countries classified as having a quasi-dependent tax regime, require that 3) IFRS be not permitted for statutory accounting purposes after IFRS adoption for consolidated purposes. Source: *Planned implementation of the IAS Regulation (1606/2002) in the EU and EEA* (2005), European Commission; and *IFRS adoption by country* (2009 & 2011), PricewaterhouseCoopers LLP
PBOpp_C	Country-level variable for the opportunities of private benefits extraction based upon the Anti-Self Dealing Index as reported in Djankov et al. (2008). Set equal to one when a country has an index score in the bottom quartile of all countries, and zero otherwise.

Control Variables

Big5	Big 5 Auditor: An indicator variable set equal to one if the firm is audited by a "Big-5" auditing firm, and zero otherwise. Source: Worldscope/Datastream and hand-collected.
Age	Firm Age: Calculated as the natural logarithm of the age of the firm in years [company fiscal-year end date (WC05350) less Datastream item BDATE divided by 365]. Source: Worldscope/Datastream.
RoA	Return on Assets: Calculated as pre-tax income (WC01401) less extraordinary income divided (WC04225) by lagged total assets (WC02999). Source: Worldscope/Datastream.
Lev	Leverage: Calculated as total long-term debt (WC03251) divided by lagged total assets (WC02999). Source: Worldscope/Datastream.
Size	Firm size: Calculated as the natural logarithm of total assets (WC03251). Source: Worldscope/Datastream.
ForOps	Foreign Operations: An indicator variable set equal to one if foreign income (WC07126) for the firm is non-missing and non-zero, and zero otherwise. Source: Worldscope/Datastream.

BM	Book-to-market ratio: Calculated as opening common equity (WC03501) divided by opening market capitalization (WC08002). Source: Worldscope/Datastream.
AggLoss	Aggregate Losses: An indicator variable set equal to one if the sum of earnings before extraordinary items and dividends (WC01551) for both the current and prior fiscal years are less than zero, and zero otherwise. Source: Worldscope/Datastream.
CFConstrnt	Cash Flow Constraint: Calculated as one minus [net cash flow from operations (WC04860) divided by lagged total assets (WC03251)]. Source: Worldscope/Datastream.
Intang	Intangibles: Calculated as intangible assets (WC02649) divided by lagged total assets (WC03251). Source: Worldscope/Datastream.
PPE	Property, Plant, and Equipment: Calculated as capital assets (WC02501) divided by lagged total assets (WC03251). Source: Worldscope/Datastream.
RnD	Research and Development: Calculated as R&D expense (WC01201) divided by lagged total assets (WC03251). Source: Worldscope/Datastream.
ADR	American Depositary Receipt: An indicator variable set equal to one if the firm trades on a U.S. exchange during the year, and zero otherwise. Source: Worldscope/Datastream and hand-collected.
BookTaxConf	Country-level variable for conformity between book and tax income as reported in Atwood et al. (2011). Higher scores correspond to greater conformity between book and tax.
Imput	Country-level indicator variable for imputation treatment of dividends. Set equal to one if the country has a full imputation system for the year, and zero otherwise. Source: www.oecd.org.
Worldwide	Country-level indicator variable for the presence of a worldwide taxation system as reported in Atwood et al. (2011). Set equal to one if the country has a worldwide tax system in place, and zero otherwise.
EarnVol	Country-level variable for earnings volatility as reported in Atwood et al. (2011). Higher scores correspond to greater volatility.
CivCom	Country-level index variable for civil versus common law as reported in La Porta et al. (1998). Set equal to one if the country has a civil law system in place, and zero otherwise.
AntiDirRights	Country-level index variable for anti-director (investor) rights as reported in La Porta et al. (1998). Higher scores correspond to less (more) director-(investor-) related rights.

OwnCon	Country-level index variable for concentration of ownership as reported in La Porta et al. (1998) as the average percentage of common shares owned by the three largest shareholders in the ten largest non-financial, privately-owned domestic firms in a given country. Higher scores corresponds to more concentrated ownership.

Table 1: Sample Composition by Country with Descriptive Statistics

	Cash ETR Spread				*Reported ETR Spread*											
	N	**%**	**Mean CETRSpr**	**Median CETRSpr**	**N**	**%**	**Mean ETRSpr**	**Median ETRSpr**	**CSTR**	**Disclosure**	**Governance**	**MediaPen**	**BookTaxConf**	**Anti-Self Dealing Index**	**Full Imputation Years**	**IFRS Adoption Date**	**Insider Trading Enforcement**
AUSTRALIA	1,789	4.2%	0.011	0.061	2,901	4.0%	0.122	0.049	31.9%	100	94	87	0.13	0.76	1993-2008	12/31/2005	1996
AUSTRIA	208	0.5%	0.049	0.109	397	0.6%	0.102	0.058	31.6%	70	79	90	-	0.21	-	12/31/2005	N/A
BELGIUM	220	0.5%	0.084	0.116	641	0.9%	0.179	0.143	37.5%	93	76	83	0.22	0.54	-	12/31/2005	1994
CANADA	1,660	3.9%	0.109	0.202	3,565	5.0%	0.178	0.139	37.7%	100	66	78	0.03	0.64	-	-	Before 1993
CHILE	156	0.4%	-0.002	0.040	356	0.5%	-0.007	-0.001	16.0%	93	76	78	-	0.63	2000-2008	-	1996
DENMARK	543	1.3%	-0.010	0.043	822	1.1%	0.090	0.039	31.4%	87	77	91	-	0.46	-	12/31/2005	1996
FINLAND	514	1.2%	-0.039	0.012	699	1.0%	0.073	0.004	27.7%	100	89	89	-	0.46	2000-2004	12/31/2005	1993
FRANCE	842	2.0%	0.057	0.084	3,202	4.5%	0.097	0.031	36.6%	100	66	80	0.78	0.38	1993-2004	12/31/2005	Before 1993
GERMANY	1,125	2.7%	0.038	0.092	2,786	3.9%	0.144	0.075	40.0%	100	73	84	0.12	0.28	1993-2000	12/31/2005	1995
GREECE	320	0.8%	-0.049	0.025	436	0.6%	0.043	0.001	33.8%	45	66	82	-	0.22	-	12/31/2005	1996
HUNGARY	94	0.2%	0.035	0.047	174	0.2%	0.088	0.065	19.7%	-	-	77	-	0.18	-	12/31/2005	1995
IRELAND	357	0.8%	0.027	0.059	505	0.7%	0.063	0.044	23.5%	100	92	80	-	0.79	-	12/31/2005	N/A
ISRAEL	106	0.3%	0.095	0.173	318	0.4%	0.181	0.159	33.4%	100	66	79	-	0.73	-	1/1/2008	Before 1993
ITALY	294	0.7%	-0.079	-0.006	1,266	1.8%	0.090	0.034	39.3%	100	66	-	0.56	0.42	1993-2003	12/31/2005	1996
JAPAN	7,650	18.1%	-0.083	-0.002	9,394	13.1%	0.026	-0.016	40.2%	100	83	95	0.71	0.50	-	-	Before 1993
LUXEMBOURG	48	0.1%	0.147	0.164	80	0.1%	0.070	0.130	31.6%	55	66	-	-	0.28	-	-	N/A
MEXICO	31	0.1%	0.140	0.199	789	1.1%	0.117	0.073	33.3%	68	66	73	0.41	0.17	1999-2008	-	N/A
NETHERLANDS	625	1.5%	0.051	0.080	1,398	2.0%	0.099	0.054	33.5%	100	86	91	0.65	0.20	-	12/31/2005	1994
NEW ZEALAND	364	0.9%	0.026	0.036	448	0.6%	0.084	0.017	32.8%	100	95	90	-	0.95	1993-2008	12/31/2005	N/A
NORWAY	453	1.1%	0.031	0.110	814	1.1%	0.095	0.035	28.0%	76	90	97	-	0.42	1993-2005	12/31/2005	Before 1993
POLAND	139	0.3%	-0.066	0.010	235	0.3%	0.026	0.008	22.3%	-	-	75	-	0.29	-	12/31/2005	1993
PORTUGAL	192	0.5%	0.079	0.172	275	0.4%	0.141	0.119	34.6%	81	70	83	-	0.44	-	12/31/2005	N/A
SOUTH KOREA	11	0.0%	0.118	0.067	1,421	2.0%	0.078	0.026	29.7%	65	78	-	0.59	0.47	-	-	Before 1993
SPAIN	202	0.5%	0.067	0.110	317	0.4%	0.140	0.100	34.5%	93	80	83	0.91	0.37	-	12/31/2005	1998
SWEDEN	829	2.0%	-0.003	0.050	1,400	2.0%	0.067	0.013	28.1%	100	97	91	0.42	0.33	-	12/31/2005	Before 1993
SWITZERLAND	860	2.0%	-0.008	0.043	1,642	2.3%	0.058	0.037	25.2%	100	87	92	0.88	0.27	-	12/31/2005	1995
TURKEY	250	0.6%	-0.001	0.034	372	0.5%	0.107	0.057	28.9%	59	67	-	-	0.43	-	-	1996
UNITED KINGDOM	6,653	15.8%	0.011	0.060	9,265	12.9%	0.085	0.030	30.7%	100	95	92	0.47	0.95	-	12/31/2005	Before 1993
UNITED STATES	15,664	37.1%	0.085	0.131	25,734	35.9%	0.164	0.072	39.4%	87	76	-	0.13	0.65	-	-	Before 1993
	42,199	100%			71,652	100%											

This table presents sample composition by country along with a summary of pertinent descriptive statistics. Variable definitions are available in the Appendix. The descriptive statistics are based upon data for the years 1993 through 2008 and with data sufficient to estimate the least restrictive empirical model. CSTR is the average enacted corporate statutory rate over the sample period. The Anti-Self Dealing Index is as reported in Djankov et al. (2008) and is used to create the *PBOpp_C* variable in subsequent tests. Any country with less than 10 observations is excluded. Please note that the IFRS Adoption date for Israel indicates the date IFRS was required for all firms except banks. Also, Norway had a full imputation system in place for the years 1993-2005 excluding the year 2000. Insider Trading Enforcement is based on Bhattacharya and Daouk (2002) and is when the first prosecution under insider trading laws took place in a country.

Table 2: Firm-Level Descriptive Statistics

Panel A: Cash ETR Spread

Variable	N	Mean	Std Dev	Min	Median	Max
CETRSpr	42,199	0.025	0.398	-2.578	0.078	0.534
ETRSpr	42,196	0.040	0.258	-1.099	0.017	1.065
ForErr	42,199	0.019	0.145	0.000	0.003	0.176
ForDisp	33,577	0.009	0.077	0.000	0.002	0.062
DiscAcc	35,074	0.000	0.155	-0.620	0.000	0.673
BidAskSpr	26,889	-4.892	1.155	-7.171	-4.897	-2.244
Disclosure	41,964	93.769	8.488	59.060	100.000	100.000
MediaPen	25,909	90.001	5.577	77.000	92.000	97.000
Governance	41,964	81.254	8.938	65.580	76.810	96.740
PostIFRS	42,199	0.164	0.370	0.000	0.000	1.000
BookTaxConf	38,494	0.352	0.264	0.031	0.130	0.875
Big5	42,199	0.447	0.497	0.000	0.000	1.000
Age	42,199	2.480	0.860	0.203	2.576	3.671
RoA	42,199	0.111	0.096	0.003	0.085	0.505
Lev	42,199	0.186	0.204	0.000	0.133	0.976
Size	42,199	14.019	2.349	9.625	13.715	20.424
ForOps	42,199	0.349	0.477	0.000	0.000	1.000
BM	42,199	5.476	18.552	-0.051	0.509	104.961
AggLoss	42,199	0.055	0.228	0.000	0.000	1.000
CFCnstrnt	42,199	0.893	0.104	0.527	0.905	1.150
Intang	42,199	0.163	0.236	0.000	0.058	1.215
PPE	42,199	0.332	0.285	0.003	0.266	1.314
RnD	42,199	0.023	0.049	0.000	0.000	0.234
ADR	42,199	0.022	0.148	0.000	0.000	1.000

Panel B: Reported ETR Spread

ETRSpr	71,652	0.112	0.325	-1.124	0.045	1.720
ForErr	71,652	0.048	0.253	0.000	0.005	0.842
ForDisp	53,354	0.019	0.140	0.000	0.003	0.205
DiscAcc	43,332	-0.001	0.165	-0.707	0.000	0.699
BidAskSpr	44,580	-4.691	1.182	-7.171	-4.690	-1.941
Disclosure	71,241	92.997	9.392	59.060	100.000	100.000
MediaPen	42,744	88.435	6.340	73.000	91.000	97.000
Governance	71,241	79.770	9.286	65.580	75.720	96.740
PostIFRS	71,652	0.145	0.352	0.000	0.000	1.000
BookTaxConf	65,823	0.348	0.267	0.031	0.130	0.875
Big5	71,652	0.400	0.490	0.000	0.000	1.000
Age	71,652	2.345	0.874	0.180	2.432	3.640
RoA	71,652	0.039	0.186	-0.806	0.054	0.461
Lev	71,652	0.180	0.211	0.000	0.117	1.081
Size	71,652	13.803	2.542	8.990	13.478	20.595
ForOps	71,652	0.287	0.452	0.000	0.000	1.000
BM	71,652	6.227	20.708	-0.159	0.540	122.885
AggLoss	71,652	0.228	0.419	0.000	0.000	1.000
CFCnstrnt	71,652	0.936	0.150	0.553	0.927	1.595
Intang	71,652	0.151	0.231	0.000	0.047	1.263
PPE	71,652	0.312	0.294	0.002	0.233	1.383
RnD	71,652	0.031	0.072	0.000	0.000	0.412
ADR	71,652	0.024	0.153	0.000	0.000	1.000

This table presents descriptive statistics for corporate tax avoidance, information opacity, and all controls as included in regression analyses. Variable definitions follow those as detailed in the Appendix. The descriptive statistics are based upon data for the years 1993 through 2008 and with data sufficient to estimate the least restrictive empirical model in which the data item is included.

Table 3: Correlation Matrix

Panel A: Most Restrictive Model

Variable		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)
CETRSpr	(1)	-	**0.42**	**0.07**	**0.09**	**0.07**	0.01	**0.08**	**-0.04**	**-0.17**	**-0.11**	**0.08**	**-0.11**	0.00	-0.01	**0.11**	**0.08**	-0.01	**-0.03**	**0.02**	**0.06**	**-0.07**	**-0.04**	**0.06**	**-0.04**	-0.01
ETRSpr	(2)	**0.30**	-	**0.07**	**0.09**	**-0.03**	**-0.02**	**0.03**	**-0.05**	**-0.26**	**-0.15**	**0.15**	**-0.16**	**0.06**	0.00	**0.03**	**0.10**	**0.02**	0.00	-0.01	-0.02	-0.01	-0.01	**0.09**	**-0.03**	**0.03**
ForErr	(3)	**0.02**	**0.07**	-	**0.49**	**0.02**	**0.18**	**0.61**	**-0.02**	-0.01	0.01	**-0.05**	**-0.02**	**-0.09**	0.00	**-0.19**	**0.04**	**-0.08**	**-0.03**	**0.22**	**0.12**	**0.11**	**-0.03**	0.00	**-0.03**	**-0.03**
ForDisp	(4)	**0.01**	**0.04**	**0.86**	-	0.01	**0.13**	**0.60**	**-0.04**	**-0.13**	**-0.06**	**0.03**	**-0.06**	**-0.10**	0.00	**-0.21**	**0.11**	**0.02**	**-0.02**	**0.22**	**0.13**	**0.09**	0.00	0.02	**-0.02**	**-0.03**
DiscAcc	(5)	**0.05**	**0.01**	**0.02**	**0.06**	-	**0.02**	**0.39**	-0.01	-0.01	0.00	0.00	0.00	-0.01	0.00	-0.01	**0.06**	**-0.03**	**-0.04**	0.01	0.01	**0.47**	**-0.04**	**-0.02**	**-0.06**	**-0.02**
BidAskSpr	(6)	**-0.05**	**0.06**	**0.09**	**0.08**	**0.07**	-	**0.49**	0.00	**-0.16**	**0.20**	**-0.04**	**-0.22**	**-0.26**	**-0.29**	**0.06**	**-0.07**	**-0.66**	**-0.10**	-0.01	**0.08**	**-0.02**	**-0.07**	**-0.03**	**-0.24**	**-0.12**
OScore	(7)	**-0.04**	**0.04**	**0.17**	**0.16**	**0.28**	**0.59**	-	**-0.03**	**-0.14**	**0.05**	0.00	**-0.12**	**-0.16**	**-0.11**	**-0.13**	**0.07**	**-0.27**	**-0.07**	**0.15**	**0.12**	**0.23**	**-0.04**	0.00	**-0.14**	**-0.05**
Disclosure	(8)	**-0.07**	**-0.05**	**-0.17**	**-0.20**	**0.01**	**0.22**	**0.22**	-	**0.11**	**0.06**	**-0.05**	0.00	**-0.02**	**0.03**	0.00	-0.02	**-0.02**	**0.02**	**-0.02**	0.01	0.00	-0.02	-0.01	**0.03**	0.00
MediaPen	(9)	**-0.10**	**-0.10**	**-0.13**	**-0.13**	0.00	**0.02**	**-0.07**	**0.21**	-	**0.51**	**-0.44**	**0.68**	**-0.10**	**0.24**	**-0.19**	**-0.16**	**0.17**	**0.16**	**0.21**	**0.02**	**0.17**	**-0.34**	**0.06**	**0.27**	**-0.04**
Governance	(10)	**-0.07**	**-0.08**	**-0.10**	**-0.13**	**0.02**	**0.27**	**0.27**	**0.35**	**0.71**	-	**-0.15**	**0.22**	**-0.17**	**0.11**	**0.06**	**0.03**	**-0.11**	**0.09**	**-0.04**	0.00	**-0.03**	**-0.15**	**0.06**	**-0.08**	-0.02
PostIFRS	(11)	**-0.02**	**-0.03**	**-0.03**	**-0.04**	0.00	**0.02**	**0.03**	**0.13**	**-0.05**	**0.17**	-	**-0.15**	**0.31**	**-0.10**	**0.13**	**0.10**	**-0.02**	**-0.12**	**-0.19**	**-0.04**	**-0.07**	**0.44**	**-0.20**	**-0.11**	**0.12**
BookTaxConf	(12)	**-0.13**	**-0.13**	**0.09**	**0.12**	**0.02**	**0.06**	**0.13**	**0.35**	**0.52**	**0.30**	**0.13**	-	**-0.05**	**0.22**	**-0.17**	**-0.11**	**0.19**	**0.12**	**0.15**	0.02	**0.15**	**-0.19**	**-0.03**	**0.24**	-0.01
Big5	(13)	**0.07**	**0.04**	**-0.11**	**-0.13**	**-0.04**	**-0.39**	**-0.33**	**-0.20**	**-0.05**	**-0.18**	**0.03**	**-0.45**	-	**0.04**	**0.03**	0.01	**0.13**	**-0.03**	**-0.12**	**-0.05**	-0.01	**0.18**	**-0.07**	**0.03**	**0.14**
Age	(14)	**-0.03**	**-0.09**	**-0.03**	**-0.04**	**-0.02**	**-0.23**	**-0.09**	**0.08**	**0.18**	**0.08**	**0.01**	**0.14**	**-0.03**	-	**-0.24**	**0.08**	**0.43**	**0.19**	**0.20**	**0.04**	**0.12**	**-0.10**	**0.14**	**0.21**	-0.01
RoA	(15)	**0.19**	**-0.26**	**-0.08**	**-0.04**	**-0.05**	**-0.21**	**-0.22**	**0.04**	0.01	**0.05**	**0.04**	**0.10**	**-0.02**	**0.14**	-	**-0.22**	**-0.32**	-0.01	**-0.46**	**-0.26**	**-0.54**	**0.06**	**-0.06**	**-0.05**	**0.04**
Lev	(16)	**0.05**	**0.01**	**-0.02**	**-0.04**	**0.02**	**-0.11**	0.01	**-0.04**	**-0.07**	**-0.02**	**0.02**	**-0.12**	**0.12**	**-0.01**	0.00	-	**0.29**	**-0.03**	-0.01	0.01	**0.11**	**0.14**	**0.33**	**-0.19**	**0.02**
Size	(17)	**0.01**	**-0.13**	**-0.04**	**-0.03**	**-0.06**	**-0.57**	**-0.28**	**-0.03**	0.01	**-0.08**	0.00	**0.10**	**0.16**	**0.32**	**0.20**	**0.16**	-	**0.14**	**0.29**	-0.01	**0.17**	**0.02**	**0.15**	**0.16**	**0.09**
ForOps	(18)	**-0.03**	**-0.03**	**-0.07**	**-0.08**	**-0.04**	**-0.13**	**-0.09**	**0.10**	**0.14**	**0.12**	**0.01**	**-0.01**	**0.10**	**0.18**	**0.07**	-0.01	**0.12**	-	**-0.03**	**0.03**	**-0.07**	-0.01	0.01	**0.23**	0.01
BM	(19)	**0.02**	**-0.02**	**0.04**	**0.05**	**-0.02**	**-0.03**	-0.01	**-0.09**	**-0.03**	**-0.04**	**-0.04**	**0.06**	**-0.04**	**0.03**	**0.02**	**-0.01**	**0.49**	**-0.05**	-	**0.09**	**0.31**	**-0.22**	**0.17**	**0.07**	**-0.05**
AggLoss	(20)	**-0.05**	**0.32**	**0.09**	**0.03**	**0.01**	**0.25**	**0.22**	**-0.01**	-0.01	**-0.03**	**-0.03**	**-0.09**	**0.01**	**-0.13**	**-0.62**	0.00	**-0.25**	**-0.02**	**-0.03**	-	**0.13**	0.01	**-0.04**	**0.05**	-0.01
CFCnstrnt	(21)	**-0.12**	**0.19**	**0.06**	**0.03**	**0.36**	**0.19**	**0.29**	**-0.02**	**0.02**	**-0.03**	**-0.02**	**-0.06**	**-0.02**	**-0.14**	**-0.76**	**-0.03**	**-0.19**	**-0.09**	**-0.02**	**0.44**	-	**-0.14**	**-0.16**	**-0.04**	**-0.05**
Intang	(22)	**0.01**	**0.02**	**-0.05**	**-0.07**	**-0.02**	**-0.03**	**-0.10**	0.00	**-0.15**	**-0.04**	**0.14**	**-0.22**	**0.18**	**-0.14**	**-0.04**	**0.25**	**-0.06**	**0.06**	**-0.07**	**0.06**	**-0.01**	-	**-0.30**	0.01	**0.07**
PPE	(23)	**0.07**	**-0.02**	**-0.01**	0.00	**-0.01**	-0.01	**0.06**	**-0.01**	**-0.11**	**0.02**	**-0.03**	**-0.01**	**-0.04**	**0.03**	**0.11**	**0.44**	**0.05**	**-0.03**	**0.03**	**-0.08**	**-0.20**	**-0.11**	-	**-0.04**	**-0.02**
RnD	(24)	**0.04**	**0.17**	**-0.04**	**-0.05**	0.01	**0.02**	**-0.02**	**-0.03**	**-0.01**	**-0.05**	**-0.02**	**-0.17**	**0.14**	**-0.13**	**-0.40**	**-0.13**	**-0.23**	**0.06**	**-0.06**	**0.29**	**0.36**	**0.08**	**-0.17**	-	**0.05**
ADR	(25)	**-0.01**	**-0.03**	**-0.02**	**-0.02**	-0.01	**-0.10**	**-0.04**	**0.03**	**-0.06**	**0.05**	**0.05**	**0.09**	**0.19**	**-0.04**	**0.03**	**0.02**	**0.14**	**0.07**	**-0.03**	**-0.04**	**-0.04**	0.00	**0.02**	0.00	-

Panel B: Least Restrictive Model

Variable		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)
CETRSpr	(1)	-																								
ETRSpr	(2)	**0.29**	-																							
ForErr	(3)	**0.01**	**0.06**	-																						
ForDisp	(4)	0.01	**0.04**	**0.87**	-																					
DiscAcc	(5)	**0.04**	0.01	0.00	**0.01**	-																				
BidAskSpr	(6)	**-0.06**	**0.06**	**0.11**	**0.09**	**0.05**	-																			
OScore	(7)	**-0.05**	**0.04**	**0.17**	**0.16**	**0.26**	**0.58**	-																		
Disclosure	(8)	**-0.08**	**-0.05**	**-0.19**	**-0.23**	0.00	**0.21**	**0.24**	-																	
MediaPen	(9)	**-0.11**	**-0.11**	**-0.12**	**-0.12**	0.00	**-0.01**	**-0.09**	**0.23**	-																
Governance	(10)	**-0.08**	**-0.08**	**-0.10**	**-0.13**	0.00	**0.24**	**0.23**	**0.35**	**0.70**	-															
PostIFRS	(11)	**-0.02**	**-0.03**	**-0.03**	**-0.04**	0.00	**0.05**	**0.07**	**0.14**	**-0.06**	**0.19**	-														
BookTaxConf	(12)	**-0.14**	**-0.15**	**0.07**	**0.11**	0.00	**0.06**	**0.12**	**0.33**	**0.54**	**0.30**	**0.12**	-													
Big5	(13)	**0.08**	**0.04**	**-0.11**	**-0.12**	**-0.02**	**-0.39**	**-0.30**	**-0.18**	**-0.06**	**-0.16**	**0.03**	**-0.45**	-												
Age	(14)	**-0.04**	**-0.09**	**-0.05**	**-0.06**	**-0.03**	**-0.25**	**-0.10**	**0.07**	**0.19**	**0.08**	0.00	**0.12**	**0.02**	-											
RoA	(15)	**0.19**	**-0.25**	**-0.09**	**-0.04**	**-0.02**	**-0.21**	**-0.22**	**0.02**	0.00	**0.04**	**0.04**	**0.09**	**0.01**	**0.11**	-										
Lev	(16)	**0.05**	**0.02**	**-0.02**	**-0.04**	0.01	**-0.12**	0.00	**-0.04**	**-0.08**	**-0.02**	**0.02**	**-0.12**	**0.13**	0.00	0.00	-									
Size	(17)	**0.01**	**-0.13**	**-0.05**	**-0.03**	**-0.06**	**-0.56**	**-0.25**	**-0.03**	**0.01**	**-0.07**	**-0.02**	**0.08**	**0.19**	**0.31**	**0.20**	**0.17**	-								
ForOps	(18)	**-0.02**	**-0.03**	**-0.06**	**-0.08**	**-0.04**	**-0.14**	**-0.08**	**0.10**	**0.14**	**0.12**	0.00	**-0.01**	**0.11**	**0.18**	**0.07**	0.00	**0.12**	-							
BM	(19)	**0.02**	**-0.02**	**0.04**	**0.06**	**-0.02**	**-0.01**	0.01	**-0.10**	**-0.04**	**-0.05**	**-0.05**	**0.06**	**-0.05**	**0.02**	**0.01**	**-0.01**	**0.50**	**-0.06**	-						
AggLoss	(20)	**-0.05**	**0.31**	**0.09**	**0.03**	0.01	**0.26**	**0.23**	0.00	**-0.02**	**-0.03**	**-0.03**	**-0.10**	**-0.02**	**-0.12**	**-0.62**	**-0.01**	**-0.25**	**-0.02**	**-0.03**	-					
CFCnstrnt	(21)	**-0.13**	**0.18**	**0.07**	**0.03**	**0.31**	**0.20**	**0.28**	**-0.01**	**0.02**	**-0.02**	**-0.01**	**-0.05**	**-0.05**	**-0.12**	**-0.76**	**-0.04**	**-0.19**	**-0.09**	**-0.01**	**0.44**	-				
Intang	(22)	**0.02**	**0.02**	**-0.05**	**-0.06**	0.00	**-0.02**	**-0.08**	**0.01**	**-0.16**	**-0.02**	**0.15**	**-0.22**	**0.17**	**-0.13**	**-0.02**	**0.25**	**-0.07**	**0.06**	**-0.08**	**0.05**	**-0.03**	-			
PPE	(23)	**0.07**	**-0.02**	**-0.01**	0.00	**-0.04**	**-0.02**	**0.03**	**-0.03**	**-0.11**	0.00	**-0.03**	**-0.01**	**-0.02**	**0.02**	**0.11**	**0.43**	**0.06**	**-0.04**	**0.03**	**-0.09**	**-0.20**	**-0.13**	-		
RnD	(24)	**0.05**	**0.17**	**-0.04**	**-0.04**	0.00	**0.03**	0.00	**-0.02**	**-0.02**	**-0.04**	**-0.02**	**-0.17**	**0.12**	**-0.12**	**-0.40**	**-0.12**	**-0.23**	**0.06**	**-0.07**	**0.29**	**0.36**	**0.08**	**-0.18**	-	
ADR	(25)	0.00	**-0.03**	**-0.02**	**-0.02**	-0.01	**-0.10**	**-0.03**	**0.03**	**-0.06**	**0.05**	**0.03**	**0.09**	**0.19**	**-0.05**	**0.03**	**0.02**	**0.14**	**0.07**	**-0.03**	**-0.04**	**-0.04**	**0.00**	**0.02**	0.00	-

This tables presents pairwise correlations of variables used in primary analyses. Panel A shows pairwise correlation based upon the most restrictive model, limiting the number of observations to 12,822 (listwise deletion). Panel B shows pairwise correlations for the least restrictive model, thus each correlation varies in its number of observations (pairwise deletion). For both panels, Pearson correlation coefficients are below the diagonal. Only Panel A shows Spearman correlation coefficients above the line. Correlations that are significant at the 5 percent level are in bold.

Table 4: Firm-Level Information Opacity and Tax Avoidance

Country Mix for Panel A

	(1)	(2)	(3)	(4)	(5)
AUSTRALIA	1,789	1,446	1,547	1,229	879
AUSTRIA	208	176	42	111	17
BELGIUM	220	193	34	217	24
CANADA	1,660	1,377	1,428	610	415
CHILE	156	83	58	10	1
DENMARK	543	444	158	514	123
FINLAND	514	456	237	496	212
FRANCE	842	705	688	821	549
GERMANY	1,125	940	842	1,093	659
GREECE	320	257	73	4	-
HUNGARY	94	78	-	52	-
IRELAND	357	316	6	227	5
ISRAEL	106	68	35	32	6
ITALY	294	265	148	236	96
JAPAN	7,650	5,406	7,542	6,946	4,687
LUXEMBOURG	48	37	-	30	-
MEXICO	31	26	11	16	6
NETHERLANDS	625	558	225	474	166
NEW ZEALAND	364	343	26	343	24
NORWAY	453	391	177	436	137
POLAND	139	121	20	132	11
PORTUGAL	192	161	11	158	-
SOUTH KOREA	11	13	2	9	2
SPAIN	202	182	13	197	13
SWEDEN	829	681	501	584	306
SWITZERLAND	860	769	520	826	452
TURKEY	250	194	76	262	56
UNITED KINGDOM	6,653	4,665	6,444	6,347	4,134
UNITED STATES	15,664	13,367	14,577	4,732	3,493
	42,199	33,718	35,441	27,144	16,473

Table 4: Firm-Level Information Opacity and Tax Avoidance (continued)

Descriptive Statistics for Panel A, Column (1)

Variable	N	Mean	Std Dev	Min	Median	Max
CETRSpr	42,199	0.025	0.398	-2.578	0.078	0.534
ForErr	42,199	0.019	0.145	0.000	0.003	0.176
Big5	42,199	0.447	0.497	0.000	0.000	1.000
Age	42,199	2.480	0.860	0.203	2.576	3.671
RoA	42,199	0.111	0.096	0.003	0.085	0.505
Lev	42,199	0.186	0.204	0.000	0.133	0.976
Size	42,199	14.019	2.349	9.625	13.715	20.424
ForOps	42,199	0.349	0.477	0.000	0.000	1.000
BM	42,199	5.476	18.552	-0.051	0.509	104.961
AggLoss	42,199	0.055	0.228	0.000	0.000	1.000
CFCnstrnt	42,199	0.893	0.104	0.527	0.905	1.150
Intang	42,199	0.163	0.236	0.000	0.058	1.215
PPE	42,199	0.332	0.285	0.003	0.266	1.314
RnD	42,199	0.023	0.049	0.000	0.000	0.234
ADR	42,199	0.022	0.148	0.000	0.000	1.000

Descriptive Statistics for Panel A, Column (2)

Variable	N	Mean	Std Dev	Min	Median	Max
CETRSpr	33,718	0.031	0.386	-2.397	0.080	0.510
ForDisp	33,718	0.009	0.076	0.000	0.002	0.062
Big5	33,718	0.490	0.500	0.000	0.000	1.000
Age	33,718	2.484	0.872	0.196	2.582	3.690
RoA	33,718	0.115	0.096	0.003	0.090	0.505
Lev	33,718	0.195	0.205	0.000	0.147	0.988
Size	33,718	14.365	2.272	10.316	14.065	20.576
ForOps	33,718	0.372	0.483	0.000	0.000	1.000
BM	33,718	5.238	17.421	-0.022	0.473	94.075
AggLoss	33,718	0.046	0.209	0.000	0.000	1.000
CFCnstrnt	33,718	0.888	0.102	0.527	0.900	1.127
Intang	33,718	0.173	0.239	0.000	0.069	1.229
PPE	33,718	0.336	0.286	0.003	0.268	1.304
RnD	33,718	0.024	0.050	0.000	0.000	0.237
ADR	33,718	0.022	0.147	0.000	0.000	1.000

Descriptive Statistics for Panel A, Column (3)

Variable	N	Mean	Std Dev	Min	Median	Max
CETRSpr	35,441	0.029	0.398	-2.493	0.081	0.531
DiscAcc	35,441	0.000	0.155	-0.620	0.000	0.674
Big5	35,441	0.470	0.499	0.000	0.000	1.000
Age	35,441	2.496	0.879	0.169	2.609	3.674
RoA	35,441	0.115	0.097	0.003	0.089	0.505
Lev	35,441	0.184	0.205	0.000	0.129	0.978
Size	35,441	13.864	2.266	9.514	13.595	19.975
ForOps	35,441	0.379	0.485	0.000	0.000	1.000
BM	35,441	4.886	17.379	-0.081	0.501	98.818
AggLoss	35,441	0.060	0.238	0.000	0.000	1.000
CFCnstrnt	35,441	0.890	0.104	0.527	0.903	1.152
Intang	35,441	0.171	0.241	0.000	0.064	1.246
PPE	35,441	0.332	0.279	0.006	0.264	1.289
RnD	35,441	0.025	0.051	0.000	0.000	0.244
ADR	35,441	0.019	0.136	0.000	0.000	1.000

Table 4: Firm-level Information Opacity and Tax Avoidance (continued)

Descriptive Statistics for Panel A, Column (4)

Variable	N	Mean	Std Dev	Min	Median	Max
CETRSpr	27,144	-0.005	0.404	-2.605	0.054	0.486
BidAskSpr	27,144	-4.886	1.156	-7.171	-4.889	-2.236
Big5	27,144	0.325	0.468	0.000	0.000	1.000
Age	27,144	2.554	0.857	0.212	2.661	3.714
RoA	27,144	0.104	0.092	0.003	0.079	0.502
Lev	27,144	0.173	0.197	0.000	0.118	0.951
Size	27,144	13.995	2.323	9.552	13.734	20.509
ForOps	27,144	0.346	0.476	0.000	0.000	1.000
BM	27,144	5.158	18.738	-0.041	0.527	109.522
AggLoss	27,144	0.054	0.226	0.000	0.000	1.000
CFCnstrnt	27,144	0.899	0.101	0.537	0.912	1.140
Intang	27,144	0.149	0.234	0.000	0.037	1.222
PPE	27,144	0.329	0.285	0.003	0.269	1.315
RnD	27,144	0.019	0.043	0.000	0.000	0.207
ADR	27,144	0.008	0.089	0.000	0.000	1.000

Descriptive Statistics for Panel A, Column (5)

Variable	N	Mean	Std Dev	Min	Median	Max
CETRSpr	16,473	0.002	0.387	-2.366	0.056	0.448
OScore	16,473	1.554	1.135	0.000	1.000	4.000
Big5	16,473	0.366	0.482	0.000	0.000	1.000
Age	16,473	2.614	0.863	0.246	2.732	3.722
RoA	16,473	0.111	0.092	0.004	0.087	0.499
Lev	16,473	0.181	0.199	0.000	0.131	0.953
Size	16,473	14.226	2.106	10.309	14.016	20.219
ForOps	16,473	0.412	0.492	0.000	0.000	1.000
BM	16,473	4.043	15.610	-0.053	0.475	88.419
AggLoss	16,473	0.047	0.212	0.000	0.000	1.000
CFCnstrnt	16,473	0.891	0.097	0.538	0.905	1.115
Intang	16,473	0.164	0.243	0.000	0.047	1.239
PPE	16,473	0.335	0.281	0.006	0.271	1.308
RnD	16,473	0.023	0.045	0.000	0.001	0.215
ADR	16,473	0.005	0.074	0.000	0.000	1.000

Table 4: Firm-Level Information Opacity and Tax Avoidance (continued)

Panel A: Cash ETR Spread

Variables	(1) CETRSpr	(2) CETRSpr	(3) CETRSpr	(4) CETRSpr	(5) CETRSpr
ForErr	0.052***				
	[0.019]				
ForDisp		0.111***			
		[0.039]			
DiscAcc			0.166***		
			[0.042]		
BidAskSpr				0.017***	
				[0.006]	
OScore					0.013***
					[0.003]
Big5	0.005	0.011	0.002	0.003	0.002
	[0.010]	[0.011]	[0.012]	[0.005]	[0.012]
Age	0.009**	0.004	0.010***	0.015***	0.007
	[0.004]	[0.004]	[0.004]	[0.005]	[0.005]
RoA	0.744***	0.702***	0.665***	0.872***	0.743***
	[0.095]	[0.104]	[0.094]	[0.138]	[0.167]
Lev	0.057***	0.055***	0.056***	0.034	0.020
	[0.021]	[0.019]	[0.022]	[0.026]	[0.023]
Size	0.004***	0.006***	0.003**	0.010***	0.008***
	[0.001]	[0.002]	[0.002]	[0.002]	[0.003]
ForOps	-0.006	0.001	-0.008	-0.009	-0.006
	[0.006]	[0.006]	[0.006]	[0.008]	[0.009]
BM	0.000***	0.000**	0.001***	0.000	0.000
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
AggLoss	-0.038	-0.075**	-0.020	-0.027	-0.081**
	[0.028]	[0.031]	[0.024]	[0.027]	[0.033]
CFCnstrnt	-0.043*	-0.034	-0.169***	-0.029	-0.057
	[0.023]	[0.027]	[0.034]	[0.033]	[0.069]
Intang	-0.048***	-0.045***	-0.050***	-0.045**	-0.040***
	[0.012]	[0.011]	[0.011]	[0.020]	[0.015]
PPE	0.059***	0.056***	0.063***	0.068***	0.073***
	[0.012]	[0.012]	[0.010]	[0.019]	[0.020]
RnD	0.155**	0.113*	0.176***	0.166**	0.122**
	[0.064]	[0.066]	[0.062]	[0.070]	[0.060]
ADR	0.005	0.001	0.008	-0.023	-0.052**
	[0.019]	[0.019]	[0.023]	[0.014]	[0.021]
Intercept	-0.161***	-0.186***	-0.055	-0.187**	-0.213*
	[0.053]	[0.064]	[0.060]	[0.078]	[0.120]
Fixed Effects	C I Y	C I Y	C I Y	C I Y	C I Y
Observations	42,199	33,718	35,441	27,144	16,473
Adjusted R-squared	0.081	0.083	0.086	0.085	0.097

This table presents OLS regression estimations of the information opacity and tax avoidance analysis using firm-level annual observations. The dependent variable in all specifications is the cash effective tax rate spread (CETRSpr). All variables are as defined in the Appendix. Robust standard errors clustered at both the firm and year level are reported in brackets below the coefficients. Additionally, country, industry, and year fixed effects are included in each model as indicated, though the coefficients are not reported. All continuous variables are winsorized at the 1 percent level. Significance levels are based upon two-sided t-tests and are indicated as follows: * p<0.1, ** p<0.05, *** p<0.01.

Table 4: Firm-Level Information Opacity and Tax Avoidance (continued)

Country Mix for Panel B

	(1)	(2)	(3)	(4)	(5)
AUSTRALIA	2,901	2,129	1,735	2,158	961
AUSTRIA	397	322	43	293	17
BELGIUM	641	535	39	616	28
CANADA	3,565	2,793	1,965	1,227	570
CHILE	356	208	62	22	1
DENMARK	822	666	183	790	142
FINLAND	699	592	300	677	257
FRANCE	3,202	2,539	782	3,103	607
GERMANY	2,786	2,184	1,049	2,690	795
GREECE	436	333	78	24	-
HUNGARY	174	124	-	98	-
IRELAND	505	436	6	334	5
ISRAEL	318	190	51	66	8
ITALY	1,266	1,033	160	1,250	100
JAPAN	9,394	6,268	8,524	8,222	5,139
LUXEMBOURG	80	66	-	48	-
MEXICO	789	640	13	543	7
NETHERLANDS	1,398	1,233	272	1,013	196
NEW ZEALAND	448	411	27	428	25
NORWAY	814	686	236	782	175
POLAND	235	171	21	209	12
PORTUGAL	275	229	11	242	-
SOUTH KOREA	1,421	945	2	1,807	2
SPAIN	317	282	16	310	16
SWEDEN	1,400	1,106	632	885	388
SWITZERLAND	1,642	1,376	596	1,572	500
TURKEY	372	277	83	367	61
UNITED KINGDOM	9,265	5,818	8,162	8,946	4,780
UNITED STATES	25,734	20,320	18,861	7,307	4,382
	71,652	53,912	43,909	46,029	19,174

Table 4: Firm-Level Information Opacity and Tax Avoidance (continued)

Descriptive Statistics for Panel B, Column (1)

Variable	N	Mean	Std Dev	Min	Median	Max
ETRSpr	71,652	0.112	0.325	-1.124	0.045	1.720
ForErr	71,652	0.048	0.253	0.000	0.005	0.842
Big5	71,652	0.400	0.490	0.000	0.000	1.000
Age	71,652	2.345	0.874	0.180	2.432	3.640
RoA	71,652	0.039	0.186	-0.806	0.054	0.461
Lev	71,652	0.180	0.211	0.000	0.117	1.081
Size	71,652	13.803	2.542	8.990	13.478	20.595
ForOps	71,652	0.287	0.452	0.000	0.000	1.000
BM	71,652	6.227	20.708	-0.159	0.540	122.885
AggLoss	71,652	0.228	0.419	0.000	0.000	1.000
CFCnstrnt	71,652	0.936	0.150	0.553	0.927	1.595
Intang	71,652	0.151	0.231	0.000	0.047	1.263
PPE	71,652	0.312	0.294	0.002	0.233	1.383
RnD	71,652	0.031	0.072	0.000	0.000	0.412
ADR	71,652	0.024	0.153	0.000	0.000	1.000

Descriptive Statistics for Panel B, Column (2)

Variable	N	Mean	Std Dev	Min	Median	Max
ETRSpr	53,912	0.099	0.313	-1.124	0.039	1.720
ForDisp	53,912	0.020	0.142	0.000	0.003	0.217
Big5	53,912	0.445	0.497	0.000	0.000	1.000
Age	53,912	2.366	0.888	0.171	2.453	3.662
RoA	53,912	0.058	0.165	-0.627	0.063	0.465
Lev	53,912	0.191	0.212	0.000	0.135	1.086
Size	53,912	14.281	2.433	9.927	13.946	20.771
ForOps	53,912	0.310	0.463	0.000	0.000	1.000
BM	53,912	6.251	20.293	-0.068	0.503	117.277
AggLoss	53,912	0.183	0.387	0.000	0.000	1.000
CFCnstrnt	53,912	0.921	0.135	0.550	0.919	1.448
Intang	53,912	0.159	0.233	0.000	0.056	1.255
PPE	53,912	0.319	0.294	0.002	0.243	1.349
RnD	53,912	0.031	0.069	0.000	0.000	0.380
ADR	53,912	0.025	0.157	0.000	0.000	1.000

Descriptive Statistics for Panel B, Column (3)

Variable	N	Mean	Std Dev	Min	Median	Max
ETRSpr	43,909	0.099	0.330	-1.124	0.032	1.720
DiscAcc	43,909	-0.001	0.165	-0.707	0.000	0.706
Big5	43,909	0.464	0.499	0.000	0.000	1.000
Age	43,909	2.435	0.893	0.155	2.536	3.670
RoA	43,909	0.060	0.170	-0.637	0.067	0.485
Lev	43,909	0.182	0.211	0.000	0.122	1.040
Size	43,909	13.638	2.341	9.062	13.391	19.901
ForOps	43,909	0.373	0.484	0.000	0.000	1.000
BM	43,909	4.856	17.603	-0.199	0.515	103.988
AggLoss	43,909	0.207	0.405	0.000	0.000	1.000
CFCnstrnt	43,909	0.918	0.136	0.538	0.917	1.440
Intang	43,909	0.173	0.245	0.000	0.066	1.300
PPE	43,909	0.315	0.277	0.005	0.243	1.274
RnD	43,909	0.033	0.066	0.000	0.000	0.333
ADR	43,909	0.017	0.131	0.000	0.000	1.000

Table 4: Firm-level Information Opacity and Tax Avoidance (continued)

Descriptive Statistics for Panel B, Column (4)

Variable	N	Mean	Std Dev	Min	Median	Max
ETRSpr	45,582	0.099	0.334	-1.124	0.035	1.720
BidAskSpr	45,582	-4.685	1.182	-7.171	-4.689	-1.927
Big5	45,582	0.280	0.449	0.000	0.000	1.000
Age	45,582	2.417	0.879	0.175	2.526	3.690
RoA	45,582	0.041	0.175	-0.736	0.055	0.455
Lev	45,582	0.171	0.202	0.000	0.112	1.023
Size	45,582	13.749	2.525	8.908	13.453	20.676
ForOps	45,582	0.285	0.451	0.000	0.000	1.000
BM	45,582	6.182	21.730	-0.153	0.559	133.124
AggLoss	45,582	0.221	0.415	0.000	0.000	1.000
CFCnstrnt	45,582	0.934	0.143	0.559	0.928	1.557
Intang	45,582	0.142	0.228	0.000	0.036	1.226
PPE	45,582	0.319	0.294	0.002	0.248	1.403
RnD	45,582	0.026	0.064	0.000	0.000	0.385
ADR	45,582	0.008	0.087	0.000	0.000	1.000

Descriptive Statistics for Panel B, Column (5)

Variable	N	Mean	Std Dev	Min	Median	Max
ETRSpr	19,174	0.074	0.319	-1.124	0.020	1.720
OScore	19,174	1.653	1.169	0.000	2.000	4.000
Big5	19,174	0.372	0.483	0.000	0.000	1.000
Age	19,174	2.579	0.871	0.257	2.693	3.720
RoA	19,174	0.076	0.140	-0.424	0.073	0.471
Lev	19,174	0.181	0.203	0.000	0.129	0.982
Size	19,174	14.118	2.155	10.026	13.923	20.206
ForOps	19,174	0.411	0.492	0.000	0.000	1.000
BM	19,174	4.182	16.189	-0.091	0.486	92.559
AggLoss	19,174	0.153	0.360	0.000	0.000	1.000
CFCnstrnt	19,174	0.908	0.115	0.551	0.913	1.288
Intang	19,174	0.165	0.243	0.000	0.051	1.268
PPE	19,174	0.325	0.281	0.005	0.257	1.307
RnD	19,174	0.028	0.058	0.000	0.001	0.298
ADR	19,174	0.005	0.072	0.000	0.000	1.000

Table 4: Firm-Level Information Opacity and Tax Avoidance (continued)

Panel B: ETR Spread

Variables	(1) ETRSpr	(2) ETRSpr	(3) ETRSpr	(4) ETRSpr	(5) ETRSpr
ForErr	0.048***				
	[0.006]				
ForDisp		0.070***			
		[0.016]			
DiscAcc			0.023*		
			[0.012]		
BidAskSpr				0.194**	
				[0.096]	
OScore					0.005*
					[0.003]
Big5	-0.015**	-0.015**	-0.017**	0.004	0.000
	[0.007]	[0.007]	[0.007]	[0.008]	[0.010]
Age	-0.001	-0.002	0.001	0.004*	0.001
	[0.002]	[0.002]	[0.003]	[0.002]	[0.003]
RoA	-0.142***	-0.175***	-0.175***	-0.136***	-0.220***
	[0.015]	[0.016]	[0.020]	[0.022]	[0.035]
Lev	0.019*	0.022**	0.013	0.013	0.002
	[0.010]	[0.009]	[0.014]	[0.012]	[0.020]
Size	-0.004***	-0.003***	-0.005***	-0.003***	-0.003
	[0.001]	[0.001]	[0.001]	[0.001]	[0.002]
ForOps	0.003	0.005	0.012**	0.005	0.017***
	[0.004]	[0.004]	[0.005]	[0.006]	[0.006]
BM	0.000*	0.000*	0.000**	0.000	0.000*
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
AggLoss	0.166***	0.164***	0.172***	0.171***	0.167***
	[0.008]	[0.010]	[0.007]	[0.010]	[0.015]
CFCnstrnt	-0.045***	-0.052**	-0.076***	-0.037**	-0.117***
	[0.017]	[0.020]	[0.015]	[0.017]	[0.027]
Intang	-0.039***	-0.038***	-0.035***	-0.037***	-0.031*
	[0.007]	[0.009]	[0.008]	[0.009]	[0.016]
PPE	0.017**	0.013*	0.013*	0.020**	0.014
	[0.007]	[0.007]	[0.007]	[0.008]	[0.014]
RnD	0.153***	0.187***	0.212***	0.109***	0.258***
	[0.025]	[0.032]	[0.034]	[0.039]	[0.069]
ADR	0.011	0.005	0.024*	0.004	0.039***
	[0.010]	[0.012]	[0.014]	[0.015]	[0.005]
Intercept	0.149***	0.160***	0.166***	0.150***	0.201***
	[0.031]	[0.034]	[0.030]	[0.034]	[0.040]
Fixed Effects	C I Y	C I Y	C I Y	C I Y	C I Y
Observations	71,652	53,912	43,909	46,029	19,174
Adjusted R-squared	0.122	0.118	0.112	0.104	0.102

This table presents OLS regression estimations of the information opacity and tax avoidance analysis using firm-level annual observations. The dependent variable in all specifications is the effective tax rate spread (ETRSpr). All variables are as defined in the Appendix. Robust standard errors clustered at both the firm and year level are reported in brackets below the coefficients. Additionally, country, industry, and year fixed effects are included in each model as indicated, though the coefficients are not reported. All continuous variables are winsorized at the 1 percent level. Significance levels are based upon two-sided t-tests and are indicated as follows: * p<0.1, ** p<0.05, *** p<0.01.

Table 4: Firm-Level Information Opacity and Tax Avoidance (continued)

Country Mix for Panel C

	(1) & (2)	(3) & (4)	(5) & (6)	(7) & (8)
AUSTRALIA	1,788	1,445	1,547	1,228
AUSTRIA	208	176	42	111
BELGIUM	220	193	34	217
CANADA	1,660	1,377	1,428	610
CHILE	156	83	58	10
DENMARK	543	444	158	514
FINLAND	514	456	237	496
FRANCE	842	705	688	821
GERMANY	1,125	940	842	1,093
GREECE	319	256	73	4
HUNGARY	94	78	-	52
IRELAND	357	316	6	227
ISRAEL	106	68	35	32
ITALY	294	265	148	236
JAPAN	7,650	5,406	7,542	6,946
LUXEMBOURG	48	37	-	30
MEXICO	31	26	11	16
NETHERLANDS	625	558	225	474
NEW ZEALAND	364	343	26	343
NORWAY	453	391	177	436
POLAND	139	121	20	132
PORTUGAL	192	161	11	158
SOUTH KOREA	11	13	2	9
SPAIN	202	182	13	197
SWEDEN	829	681	501	584
SWITZERLAND	860	769	520	826
TURKEY	250	194	76	262
UNITED KINGDOM	6,653	4,665	6,444	6,347
UNITED STATES	15,663	13,366	14,577	4,732
	42,196	33,715	35,441	27,143

Table 4: Firm-Level Information Opacity and Tax Avoidance (continued)

Summary Statistics for Panel C, Column (1)

Variable	N	Mean	Std Dev	Min	Median	Max
CETRSpr	42,196	0.025	0.398	-2.578	0.078	0.533
ETRSpr	42,196	0.040	0.258	-1.099	0.017	1.065
ForErr	42,196	0.019	0.145	0.000	0.003	0.176
Big5	42,196	0.447	0.497	0.000	0.000	1.000
Age	42,196	2.480	0.860	0.203	2.576	3.671
RoA	42,196	0.111	0.096	0.003	0.085	0.505
Lev	42,196	0.186	0.204	0.000	0.133	0.976
Size	42,196	14.019	2.349	9.625	13.715	20.424
ForOps	42,196	0.349	0.477	0.000	0.000	1.000
BM	42,196	5.476	18.552	-0.051	0.509	104.961
AggLoss	42,196	0.055	0.228	0.000	0.000	1.000
CFCnstrnt	42,196	0.893	0.104	0.527	0.905	1.150
Intang	42,196	0.163	0.236	0.000	0.058	1.215
PPE	42,196	0.332	0.285	0.003	0.266	1.314
RnD	42,196	0.023	0.049	0.000	0.000	0.234
ADR	42,196	0.022	0.148	0.000	0.000	1.000

Summary Statistics for Panel C, Column (2)

Variable	N	Mean	Std Dev	Min	Median	Max
CETRSpr	33,715	0.031	0.386	-2.397	0.080	0.509
ETRSpr	33,715	0.039	0.247	-0.997	0.019	0.971
ForDisp	33,715	0.009	0.076	0.000	0.002	0.062
Big5	33,715	0.490	0.500	0.000	0.000	1.000
Age	33,715	2.484	0.872	0.196	2.582	3.690
RoA	33,715	0.115	0.096	0.003	0.090	0.505
Lev	33,715	0.195	0.205	0.000	0.147	0.988
Size	33,715	14.365	2.272	10.316	14.065	20.576
ForOps	33,715	0.372	0.483	0.000	0.000	1.000
BM	33,715	5.237	17.421	-0.022	0.473	94.075
AggLoss	33,715	0.046	0.209	0.000	0.000	1.000
CFCnstrnt	33,715	0.888	0.102	0.527	0.900	1.127
Intang	33,715	0.173	0.239	0.000	0.069	1.229
PPE	33,715	0.336	0.286	0.003	0.269	1.304
RnD	33,715	0.024	0.050	0.000	0.000	0.237
ADR	33,715	0.022	0.147	0.000	0.000	1.000

Table 4: Firm-Level Information Opacity and Tax Avoidance (continued)

Summary Statistics for Panel C, Column (3)

Variable	N	Mean	Std Dev	Min	Median	Max
CETRSpr	35,441	0.029	0.398	-2.493	0.081	0.531
ETRSpr	35,441	0.038	0.261	-1.106	0.015	1.101
DiscAcc	35,441	0.000	0.155	-0.620	0.000	0.674
Big5	35,441	0.470	0.499	0.000	0.000	1.000
Age	35,441	2.496	0.879	0.169	2.609	3.674
RoA	35,441	0.115	0.097	0.003	0.089	0.505
Lev	35,441	0.184	0.205	0.000	0.129	0.978
Size	35,441	13.864	2.266	9.514	13.595	19.975
ForOps	35,441	0.379	0.485	0.000	0.000	1.000
BM	35,441	4.886	17.379	-0.081	0.501	98.818
AggLoss	35,441	0.060	0.238	0.000	0.000	1.000
CFCnstrnt	35,441	0.890	0.104	0.527	0.903	1.152
Intang	35,441	0.171	0.241	0.000	0.064	1.246
PPE	35,441	0.332	0.279	0.006	0.264	1.289
RnD	35,441	0.025	0.051	0.000	0.000	0.244
ADR	35,441	0.019	0.136	0.000	0.000	1.000

Summary Statistics for Panel C, Column (4)

Variable	N	Mean	Std Dev	Min	Median	Max
CETRSpr	27,143	-0.005	0.404	-2.605	0.054	0.486
ETRSpr	27,143	0.030	0.261	-1.124	0.010	1.054
BidAskSpr	27,143	-4.886	1.156	-7.171	-4.889	-2.236
Big5	27,143	0.325	0.468	0.000	0.000	1.000
Age	27,143	2.554	0.857	0.212	2.661	3.714
RoA	27,143	0.104	0.092	0.003	0.079	0.502
Lev	27,143	0.173	0.197	0.000	0.118	0.951
Size	27,143	13.995	2.323	9.552	13.734	20.509
ForOps	27,143	0.346	0.476	0.000	0.000	1.000
BM	27,143	5.158	18.738	-0.041	0.527	109.522
AggLoss	27,143	0.054	0.226	0.000	0.000	1.000
CFCnstrnt	27,143	0.899	0.101	0.537	0.912	1.140
Intang	27,143	0.149	0.234	0.000	0.037	1.222
PPE	27,143	0.329	0.285	0.003	0.269	1.315
RnD	27,143	0.019	0.043	0.000	0.000	0.207
ADR	27,143	0.008	0.089	0.000	0.000	1.000

Table 4: Firm-Level Information Opacity and Tax Avoidance (continued)

Panel C: Common CETR & ETR Sample

Variables	(1) CETRSpr	(2) ETRSpr	(3) CETRSpr	(4) ETRSpr	(5) CETRSpr	(6) ETRSpr	(7) CETRSpr	(8) ETRSpr
ForErr	0.052***	0.034***						
	[0.019]	[0.011]						
ForDisp			0.111***	0.025				
			[0.039]	[0.028]				
DiscAcc					0.166***	-0.003		
					[0.042]	[0.013]		
BidAskSpr							0.017***	0.010***
							[0.006]	[0.002]
Big5	0.005	-0.019**	0.011	-0.013	0.002	-0.021**	0.003	-0.005
	[0.010]	[0.009]	[0.011]	[0.010]	[0.012]	[0.008]	[0.005]	[0.011]
Age	0.009**	0.005**	0.004	0.003	0.010***	0.006**	0.015***	0.008***
	[0.004]	[0.002]	[0.004]	[0.002]	[0.004]	[0.003]	[0.005]	[0.003]
RoA	0.744***	-0.020	0.702***	-0.024	0.665***	-0.009	0.872***	0.030
	[0.095]	[0.042]	[0.104]	[0.049]	[0.094]	[0.040]	[0.138]	[0.062]
Lev	0.057***	0.024*	0.055***	0.022*	0.056***	0.028*	0.034	0.017
	[0.021]	[0.013]	[0.019]	[0.012]	[0.022]	[0.016]	[0.026]	[0.018]
Size	0.004***	-0.006***	0.006***	-0.004***	0.003**	-0.007***	0.010***	-0.003*
	[0.001]	[0.001]	[0.002]	[0.001]	[0.002]	[0.001]	[0.002]	[0.001]
ForOps	-0.006	-0.004	0.001	-0.000	-0.008	-0.004	-0.009	-0.005
	[0.006]	[0.005]	[0.006]	[0.005]	[0.006]	[0.005]	[0.008]	[0.007]
BM	0.000***	0.000***	0.000**	0.000**	0.001***	0.000***	0.000	0.000
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
AggLoss	-0.038	-0.080***	-0.075**	-0.092***	-0.020	-0.072***	-0.027	-0.081***
	[0.028]	[0.020]	[0.031]	[0.021]	[0.024]	[0.018]	[0.027]	[0.026]
CFCnstrnt	-0.043*	0.022	-0.034	0.022	-0.169***	0.026	-0.029	0.049**
	[0.023]	[0.018]	[0.027]	[0.019]	[0.034]	[0.016]	[0.033]	[0.023]
Intang	-0.048***	-0.049***	-0.045***	-0.048***	-0.050***	-0.055***	-0.045**	-0.038**
	[0.012]	[0.017]	[0.011]	[0.017]	[0.011]	[0.015]	[0.020]	[0.018]
PPE	0.059***	0.044***	0.056***	0.034***	0.063***	0.045***	0.068***	0.059***
	[0.012]	[0.009]	[0.012]	[0.009]	[0.010]	[0.008]	[0.019]	[0.011]
RnD	0.155**	0.451***	0.113*	0.411***	0.176***	0.466***	0.166**	0.460***
	[0.064]	[0.074]	[0.066]	[0.068]	[0.062]	[0.075]	[0.070]	[0.097]
ADR	0.005	0.019	0.001	0.005	0.008	0.024*	-0.023	0.028***
	[0.019]	[0.014]	[0.019]	[0.013]	[0.023]	[0.014]	[0.014]	[0.007]
Intercept	-0.160***	0.059**	-0.183***	0.052	-0.055	0.051*	-0.204***	0.017
	[0.053]	[0.030]	[0.064]	[0.034]	[0.060]	[0.027]	[0.079]	[0.036]
Fixed Effects	C I Y	C I Y	C I Y	C I Y	C I Y	C I Y	C I Y	C I Y
Observations	42,196	42,196	33,715	33,715	35,441	35,441	27,143	27,143
Adjusted R-squared	0.081	0.058	0.083	0.059	0.086	0.062	0.085	0.057

This table presents OLS regression estimations of the information opacity and tax avoidance analysis using firm-level annual observations for a sample which includes the requisite data for calculating both the CETRSpr and ETRSpr. All variables are as defined in the Appendix. Robust standard errors clustered at both the firm and year level are reported in brackets below the coefficients. Additionally, country, industry, and year fixed effects are included in each model as indicated, though the coefficients are not reported. All continuous variables are winsorized at the 1 percent level. Significance levels are based upon two-sided t-tests and are indicated as follows: * p<0.1, ** p<0.05, *** p<0.01.

Table 5: Country-Level Information Opacity and Tax Avoidance

Country Mix for Panel A

	(1)	(2)	(3)	(4)
AUSTRALIA	879	879	877	879
AUSTRIA	17	17	11	17
BELGIUM	24	24	24	24
CANADA	415	415	415	415
CHILE	1	1	1	1
DENMARK	123	123	123	123
FINLAND	212	212	212	212
FRANCE	549	549	559	549
GERMANY	659	659	664	659
IRELAND	5	5	5	5
ISRAEL	6	6	6	6
ITALY	96	96	-	96
JAPAN	4,687	4,687	4,687	4,687
MEXICO	6	6	6	6
NETHERLANDS	166	166	158	166
NEW ZEALAND	24	24	24	24
NORWAY	137	137	138	137
POLAND	-	-	11	11
SOUTH KOREA	2	2	-	2
SPAIN	13	13	13	13
SWEDEN	306	306	309	306
SWITZERLAND	452	452	448	452
TURKEY	56	56	-	56
UNITED KINGDOM	4,134	4,134	4,131	4,134
UNITED STATES	3,493	3,493	-	3,493
	16,462	16,462	12,822	16,473

Table 5: Country-Level Information Opacity and Tax Avoidance (continued)

Descriptive Statistics for Panel A, Column (1)

Variable	N	Mean	Std Dev	Min	Median	Max
CETRSpr	16,462	0.002	0.387	-2.366	0.056	0.448
OScore	16,462	1.554	1.135	0.000	1.000	4.000
Governance	16,462	83.709	9.015	65.580	82.610	96.740
Big5	16,462	0.366	0.482	0.000	0.000	1.000
Age	16,462	2.615	0.863	0.246	2.733	3.722
RoA	16,462	0.111	0.092	0.004	0.087	0.499
Lev	16,462	0.181	0.199	0.000	0.131	0.953
Size	16,462	14.227	2.107	10.309	14.019	20.219
ForOps	16,462	0.412	0.492	0.000	0.000	1.000
BM	16,462	4.046	15.615	-0.053	0.476	88.419
AggLoss	16,462	0.047	0.212	0.000	0.000	1.000
CFCnstrnt	16,462	0.891	0.096	0.538	0.905	1.114
Intang	16,462	0.164	0.243	0.000	0.047	1.239
PPE	16,462	0.335	0.281	0.006	0.271	1.308
RnD	16,462	0.023	0.045	0.000	0.001	0.215
ADR	16,462	0.005	0.074	0.000	0.000	1.000

Descriptive Statistics for Panel A, Column (2)

Variable	N	Mean	Std Dev	Min	Median	Max
CETRSpr	16,462	0.002	0.387	-2.366	0.056	0.448
OScore	16,462	1.554	1.135	0.000	1.000	4.000
Disclosure	16,462	96.817	6.083	76.450	100.000	100.000
Big5	16,462	0.366	0.482	0.000	0.000	1.000
Age	16,462	2.615	0.863	0.246	2.733	3.722
RoA	16,462	0.111	0.092	0.004	0.087	0.499
Lev	16,462	0.181	0.199	0.000	0.131	0.953
Size	16,462	14.227	2.107	10.309	14.019	20.219
ForOps	16,462	0.412	0.492	0.000	0.000	1.000
BM	16,462	4.046	15.615	-0.053	0.476	88.419
AggLoss	16,462	0.047	0.212	0.000	0.000	1.000
CFCnstrnt	16,462	0.891	0.096	0.538	0.905	1.114
Intang	16,462	0.164	0.243	0.000	0.047	1.239
PPE	16,462	0.335	0.281	0.006	0.271	1.308
RnD	16,462	0.023	0.045	0.000	0.001	0.215
ADR	16,462	0.005	0.074	0.000	0.000	1.000

Table 5: Country-Level Information Opacity and Tax Avoidance (continued)

Descriptive Statistics for Panel A, Column (3)

Variable	N	Mean	Std Dev	Min	Median	Max
CETRSpr	12,822	-0.022	0.383	-2.315	0.036	0.430
OScore	12,822	1.757	1.124	0.000	2.000	4.000
MediaPen	12,822	91.255	4.654	78.000	92.000	97.000
Big5	12,822	0.225	0.417	0.000	0.000	1.000
Age	12,822	2.639	0.859	0.268	2.774	3.738
RoA	12,822	0.107	0.090	0.004	0.083	0.475
Lev	12,822	0.168	0.186	0.000	0.121	0.866
Size	12,822	14.117	2.038	10.246	13.961	19.664
ForOps	12,822	0.408	0.492	0.000	0.000	1.000
BM	12,822	3.884	15.943	-0.028	0.511	93.850
AggLoss	12,822	0.049	0.215	0.000	0.000	1.000
CFCnstrnt	12,822	0.898	0.096	0.548	0.910	1.121
Intang	12,822	0.135	0.228	0.000	0.027	1.161
PPE	12,822	0.344	0.276	0.005	0.290	1.290
RnD	12,822	0.021	0.042	0.000	0.001	0.197
ADR	12,822	0.007	0.083	0.000	0.000	1.000

Descriptive Statistics for Panel A, Column (4)

Variable	N	Mean	Std Dev	Min	Median	Max
CETRSpr	16,473	0.002	0.387	-2.366	0.056	0.448
OScore	16,473	1.554	1.135	0.000	1.000	4.000
PostIFRS	16,473	0.205	0.403	0.000	0.000	1.000
Big5	16,473	0.366	0.482	0.000	0.000	1.000
Age	16,473	2.614	0.863	0.246	2.732	3.722
RoA	16,473	0.111	0.092	0.004	0.087	0.499
Lev	16,473	0.181	0.199	0.000	0.131	0.953
Size	16,473	14.226	2.106	10.309	14.016	20.219
ForOps	16,473	0.412	0.492	0.000	0.000	1.000
BM	16,473	4.043	15.610	-0.053	0.475	88.419
AggLoss	16,473	0.047	0.212	0.000	0.000	1.000
CFCnstrnt	16,473	0.891	0.097	0.538	0.905	1.115
Intang	16,473	0.164	0.243	0.000	0.047	1.239
PPE	16,473	0.335	0.281	0.006	0.271	1.308
RnD	16,473	0.023	0.045	0.000	0.001	0.215
ADR	16,473	0.005	0.074	0.000	0.000	1.000

Table 5: Country-Level Information Opacity and Tax Avoidance (continued)

Panel A: Cash ETR Spread

Variables	(1) CETRSpr	(2) CETRSpr	(3) CETRSpr	(4) CETRSpr
Governance	-0.002***			
	[0.001]			
Disclosure		-0.004***		
		[0.001]		
MediaPen			-0.006***	
			[0.001]	
PostIFRS				-0.039***
				[0.011]
OScore	0.013***	0.014***	0.015***	0.015***
	[0.005]	[0.004]	[0.003]	[0.004]
Big5	0.030**	0.013	0.014	0.025
	[0.014]	[0.011]	[0.017]	[0.016]
Age	0.008	0.005	0.013***	0.004
	[0.005]	[0.005]	[0.004]	[0.005]
RoA	0.762***	0.744***	0.835***	0.753***
	[0.173]	[0.176]	[0.190]	[0.174]
Lev	0.043*	0.029	0.033	0.040*
	[0.023]	[0.024]	[0.029]	[0.023]
Size	0.006**	0.008***	0.009***	0.008***
	[0.003]	[0.003]	[0.003]	[0.003]
ForOps	-0.005	-0.007	-0.009	-0.010
	[0.010]	[0.009]	[0.011]	[0.010]
BM	0.000	0.000	-0.000	0.000
	[0.000]	[0.000]	[0.000]	[0.000]
AggLoss	-0.075**	-0.076**	-0.052*	-0.074**
	[0.032]	[0.032]	[0.028]	[0.032]
CFCnstrnt	-0.099	-0.090	-0.025	-0.106*
	[0.063]	[0.066]	[0.061]	[0.063]
Intang	0.005	-0.007	-0.037*	0.006
	[0.015]	[0.017]	[0.020]	[0.018]
PPE	0.073***	0.073***	0.062***	0.071***
	[0.020]	[0.020]	[0.020]	[0.020]
RnD	0.156**	0.154**	0.111*	0.163***
	[0.062]	[0.060]	[0.063]	[0.062]
ADR	-0.062***	-0.053***	-0.051***	-0.056***
	[0.017]	[0.014]	[0.017]	[0.014]
Intercept	0.100	0.249**	0.282***	-0.138
	[0.158]	[0.108]	[0.109]	[0.108]
Fixed Effects	I Y	I Y	I Y	I Y
Observations	16,462	16,462	12,822	16,473
Adjusted R-squared	0.090	0.090	0.093	0.089

This table presents OLS regression estimations of country-level information opacity measures and firm-level tax avoidance analysis. The dependent variable in all specifications is the cash effective tax rate spread (CETRSpr). All variables are as defined in the Appendix. Robust standard errors clustered at both the firm and year level are reported in brackets below the coefficients. Additionally, industry, and year fixed effects are included in each model as indicated, though the coefficients are not reported. All continuous variables are winsorized at the 1 percent level. Significance levels are based upon two-sided t-tests and are indicated as follows: * p<0.1, ** p<0.05, *** p<0.01.

Table 5: Country-Level Information Opacity and Tax Avoidance (continued)

Country Mix for Panel B

	(1)	(2)	(3)	(4)
AUSTRALIA	961	961	958	961
AUSTRIA	17	17	11	17
BELGIUM	28	28	28	28
CANADA	570	570	565	570
CHILE	1	1	1	1
DENMARK	142	142	142	142
FINLAND	257	257	257	257
FRANCE	607	607	622	607
GERMANY	795	795	800	795
IRELAND	5	5	5	5
ISRAEL	8	8	6	8
ITALY	100	100	-	100
JAPAN	5,139	5,139	5,139	5,139
MEXICO	7	7	7	7
NETHERLANDS	196	196	186	196
NEW ZEALAND	25	25	25	25
NORWAY	175	175	176	175
POLAND	-	-	12	12
SOUTH KOREA	2	2	-	2
SPAIN	16	16	16	16
SWEDEN	388	388	391	388
SWITZERLAND	500	500	492	500
TURKEY	61	61	-	61
UNITED KINGDOM	4,780	4,780	4,778	4,780
UNITED STATES	4,382	4,382	-	4,382
	19,162	19,162	14,617	19,174

Table 5: Country-Level Information Opacity and Tax Avoidance (continued)

Descriptive Statistics for Panel B, Column (1)

Variable	N	Mean	Std Dev	Min	Median	Max
ETRSpr	19,162	0.074	0.319	-1.124	0.020	1.720
OScore	19,162	1.653	1.169	0.000	2.000	4.000
Governance	19,162	83.515	9.101	65.580	82.610	96.740
Big5	19,162	0.372	0.483	0.000	0.000	1.000
Age	19,162	2.580	0.871	0.257	2.694	3.720
RoA	19,162	0.076	0.141	-0.424	0.073	0.471
Lev	19,162	0.181	0.203	0.000	0.129	0.982
Size	19,162	14.119	2.155	10.026	13.924	20.206
ForOps	19,162	0.411	0.492	0.000	0.000	1.000
BM	19,162	4.185	16.193	-0.091	0.487	92.559
AggLoss	19,162	0.153	0.360	0.000	0.000	1.000
CFCnstrnt	19,162	0.908	0.115	0.551	0.913	1.288
Intang	19,162	0.165	0.243	0.000	0.051	1.268
PPE	19,162	0.325	0.281	0.005	0.257	1.307
RnD	19,162	0.028	0.058	0.000	0.001	0.298
ADR	19,162	0.005	0.072	0.000	0.000	1.000

Descriptive Statistics for Panel B, Column (2)

Variable	N	Mean	Std Dev	Min	Median	Max
ETRSpr	19,162	0.074	0.319	-1.124	0.020	1.720
OScore	19,162	1.653	1.169	0.000	2.000	4.000
Disclosure	19,162	96.597	6.182	76.450	100.000	100.000
Big5	19,162	0.372	0.483	0.000	0.000	1.000
Age	19,162	2.580	0.871	0.257	2.694	3.720
RoA	19,162	0.076	0.141	-0.424	0.073	0.471
Lev	19,162	0.181	0.203	0.000	0.129	0.982
Size	19,162	14.119	2.155	10.026	13.924	20.206
ForOps	19,162	0.411	0.492	0.000	0.000	1.000
BM	19,162	4.185	16.193	-0.091	0.487	92.559
AggLoss	19,162	0.153	0.360	0.000	0.000	1.000
CFCnstrnt	19,162	0.908	0.115	0.551	0.913	1.288
Intang	19,162	0.165	0.243	0.000	0.051	1.268
PPE	19,162	0.325	0.281	0.005	0.257	1.307
RnD	19,162	0.028	0.058	0.000	0.001	0.298
ADR	19,162	0.005	0.072	0.000	0.000	1.000

Table 5: Country-Level Information Opacity and Tax Avoidance (continued)

Descriptive Statistics for Panel B, Column (3)

Variable	N	Mean	Std Dev	Min	Median	Max
ETRSpr	14,617	0.051	0.304	-1.124	0.007	1.605
OScore	14,617	1.864	1.150	0.000	2.000	4.000
MediaPen	14,617	91.130	4.750	78.000	92.000	97.000
Big5	14,617	0.223	0.417	0.000	0.000	1.000
Age	14,617	2.612	0.870	0.272	2.750	3.738
RoA	14,617	0.078	0.131	-0.388	0.071	0.461
Lev	14,617	0.166	0.186	0.000	0.119	0.866
Size	14,617	14.027	2.080	9.966	13.890	19.652
ForOps	14,617	0.407	0.491	0.000	0.000	1.000
BM	14,617	3.971	16.428	-0.047	0.522	98.622
AggLoss	14,617	0.139	0.346	0.000	0.000	1.000
CFCnstrnt	14,617	0.911	0.111	0.555	0.917	1.273
Intang	14,617	0.136	0.228	0.000	0.028	1.173
PPE	14,617	0.337	0.277	0.005	0.280	1.303
RnD	14,617	0.024	0.052	0.000	0.001	0.276
ADR	14,617	0.007	0.082	0.000	0.000	1.000

Descriptive Statistics for Panel B, Column (4)

Variable	N	Mean	Std Dev	Min	Median	Max
ETRSpr	19,174	0.074	0.319	-1.124	0.020	1.720
OScore	19,174	1.653	1.169	0.000	2.000	4.000
PostIFRS	19,174	0.197	0.398	0.000	0.000	1.000
Big5	19,174	0.372	0.483	0.000	0.000	1.000
Age	19,174	2.579	0.871	0.257	2.693	3.720
RoA	19,174	0.076	0.140	-0.424	0.073	0.471
Lev	19,174	0.181	0.203	0.000	0.129	0.982
Size	19,174	14.118	2.155	10.026	13.923	20.206
ForOps	19,174	0.411	0.492	0.000	0.000	1.000
BM	19,174	4.182	16.189	-0.091	0.486	92.559
AggLoss	19,174	0.153	0.360	0.000	0.000	1.000
CFCnstrnt	19,174	0.908	0.115	0.551	0.913	1.288
Intang	19,174	0.165	0.243	0.000	0.051	1.268
PPE	19,174	0.325	0.281	0.005	0.257	1.307
RnD	19,174	0.028	0.058	0.000	0.001	0.298
ADR	19,174	0.005	0.072	0.000	0.000	1.000

Table 5: Country-Level Information Opacity and Tax Avoidance (continued)

Panel B: ETR Spread

Variables	(1) ETRSpr	(2) ETRSpr	(3) ETRSpr	(4) ETRSpr
Governance	-0.002***			
	[0.001]			
Disclosure		-0.004***		
		[0.001]		
MediaPen			-0.006***	
			[0.001]	
PostIFRS				-0.026***
				[0.010]
OScore	0.005	0.007**	0.005	0.006**
	[0.004]	[0.003]	[0.003]	[0.003]
Big5	0.024***	0.008	0.001	0.022**
	[0.007]	[0.007]	[0.011]	[0.010]
Age	-0.000	-0.002	0.000	-0.003
	[0.003]	[0.004]	[0.004]	[0.003]
RoA	-0.225***	-0.227***	-0.222***	-0.227***
	[0.032]	[0.034]	[0.039]	[0.032]
Lev	0.020	0.007	0.019	0.018
	[0.024]	[0.022]	[0.022]	[0.023]
Size	-0.006***	-0.004**	-0.004**	-0.004***
	[0.002]	[0.002]	[0.002]	[0.002]
ForOps	0.017***	0.016***	0.008	0.013**
	[0.005]	[0.005]	[0.006]	[0.006]
BM	0.001***	0.000**	0.000	0.000***
	[0.000]	[0.000]	[0.000]	[0.000]
AggLoss	0.177***	0.173***	0.162***	0.177***
	[0.017]	[0.016]	[0.017]	[0.016]
CFCnstrnt	-0.154***	-0.147***	-0.101***	-0.159***
	[0.023]	[0.025]	[0.028]	[0.023]
Intang	0.004	-0.005	-0.020	0.003
	[0.017]	[0.016]	[0.021]	[0.016]
PPE	0.019	0.021	0.026*	0.019
	[0.014]	[0.014]	[0.014]	[0.014]
RnD	0.295***	0.281***	0.113*	0.294***
	[0.072]	[0.068]	[0.068]	[0.073]
ADR	0.019	0.031***	0.039***	0.022
	[0.017]	[0.011]	[0.010]	[0.015]
Intercept	0.407***	0.589***	0.685***	0.225***
	[0.063]	[0.057]	[0.084]	[0.030]
Fixed Effects	I Y	I Y	I Y	I Y
Observations	19,162	19,162	14,617	19,174
Adjusted R-squared	0.095	0.097	0.076	0.093

This table presents OLS regression estimations of country-level information opacity measures and firm-level tax avoidance analysis. The dependent variable in all specifications is the effective tax rate spread (ETRSpr). All variables are as defined in the Appendix. Robust standard errors clustered at both the firm and year level are reported in brackets below the coefficients. Additionally, industry, and year fixed effects are included in each model as indicated, though the coefficients are not reported. All continuous variables are winsorized at the 1 percent level. Significance levels are based upon two-sided t-tests and are indicated as follows: * p<0.1, ** p<0.05, *** p<0.01.

Table 6: Tax Regime, Statutory Accounting, and IFRS Adoption by Country

	Type of Tax Regime	Taxable Profit Based On?	IFRS Allowed for Statutory Accounts?	IFRS Adoption Date	Treatment Group?
AUSTRALIA	Independent	-	-	12/31/2005	Yes
AUSTRIA	Quasi-Dependent	Legal-Entity Statutory	Not Permitted	12/31/2005	Yes
BELGIUM	Quasi-Dependent	Legal-Entity Statutory	Not Permitted	12/31/2005	Yes
CANADA	Independent	-	-	-	-
CHILE	Quasi-Dependent	Legal-Entity Statutory	Not Permitted	-	-
DENMARK	Independent	-	-	12/31/2005	Yes
FINLAND	Quasi-Dependent	Legal-Entity Statutory	Permitted	12/31/2005	-
FRANCE	Quasi-Dependent	Legal-Entity Statutory	Not Permitted	12/31/2005	Yes
GERMANY	Quasi-Dependent	Legal-Entity Statutory	Not Permitted	12/31/2005	Yes
GREECE	Quasi-Dependent	Legal-Entity Statutory	Permitted	12/31/2005	-
HUNGARY	Quasi-Dependent	Legal-Entity Statutory	Not Permitted	12/31/2005	Yes
IRELAND	Quasi-Dependent	Legal-Entity Statutory	Permitted	12/31/2005	-
ISRAEL	Quasi-Dependent	Legal-Entity Statutory	Not Permitted	1/1/2008	-
ITALY	Quasi-Dependent	Legal-Entity Statutory	Permitted	12/31/2005	-
JAPAN	Quasi-Dependent	Legal-Entity Statutory	Not Permitted	-	-
LUXEMBOURG	Dependent	Legal-Entity Statutory	Permitted	-	-
MEXICO	Quasi-Dependent	Legal-Entity Statutory	Not Permitted	-	-
NETHERLANDS	Quasi-Dependent	Legal-Entity Statutory	Permitted	12/31/2005	-
NEW ZEALAND	Quasi-Dependent	Legal-Entity Statutory	Required	12/31/2005	-
NORWAY	Quasi-Dependent	Legal-Entity Statutory	Permitted	12/31/2005	-
POLAND	Independent	-	-	12/31/2005	Yes
PORTUGAL	Quasi-Dependent	Legal-Entity Statutory	Permitted	12/31/2005	-
SOUTH KOREA	Quasi-Dependent	Legal-Entity Statutory	Not Permitted	-	-
SPAIN	Quasi-Dependent	Legal-Entity Statutory	Not Permitted	12/31/2005	Yes
SWEDEN	Quasi-Dependent	Legal-Entity Statutory	Not Permitted	12/31/2005	Yes
SWITZERLAND	Quasi-Dependent	Legal-Entity Statutory	Not Permitted	12/31/2005	Yes
TURKEY	Quasi-Dependent	Legal-Entity Statutory	Not Permitted	-	-
UNITED KINGDOM	Quasi-Dependent	Legal-Entity Statutory	Permitted	12/31/2005	-
UNITED STATES	Independent	-	-	-	-

This table presents the taxing regime by country along with a summary of whether International Financial Reporting Standards is required, permitted, or not permitted in the statutory accounts, if applicable. The column titled Type of Tax Regime indicates whether the tax regime for the country is dependent on financial reporting, independent of financial reporting, or quasi-dependent. In all cases where the tax regime is quasi-dependent, taxable profit is based upon the legal-entity statutory accounts, as is seen in the third column. As in Table 1, the IFRS Adoption date for Israel indicates the date IFRS was required for all firms except banks. Data is taken from Planned Implementation of the IAS Regulation (1606/2002) in the EU and EEA 2005 as compiled by the European Commission as well as from IFRS Adoption by Country 2009 & 2011 as provided by PricewaterhouseCoopers LLP.

Table 7: Tax Avoidance and IFRS Adoption as Shock to Information Opacity

					Robustness					
					Random 11 Countries		*Random Year as IFRS*		*Excluding USA*	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Variables	**CETRSpr**	**CETRSca**	**CETRSpr**	**CETRSca**	**CETRSpr**	**CETRSca**	**CETRSpr**	**CETRSca**	**CETRSpr**	**CETRSca**
Adopter	0.016	0.002			-0.017	0.033	-0.022	0.043	-0.025*	0.037
	[0.116]	[0.333]			[0.014]	[0.035]	[0.015]	[0.041]	[0.013]	[0.034]
PostYears	-0.014	0.020			-0.008	0.033	0.002	0.036	0.010	0.016
	[0.015]	[0.040]			[0.053]	[0.173]	[0.115]	[0.332]	[0.121]	[0.348]
Adopter*PostYears	-0.042**	0.118*	-0.043**	0.121**	-0.010	0.012	-0.026	0.083	-0.055**	0.155**
	[0.021]	[0.061]	[0.020]	[0.059]	[0.017]	[0.049]	[0.019]	[0.055]	[0.023]	[0.062]
Big5	0.007	-0.015	0.007	-0.014	0.006	-0.009	0.007	-0.014	-0.015	0.046
	[0.010]	[0.029]	[0.010]	[0.028]	[0.010]	[0.029]	[0.010]	[0.029]	[0.013]	[0.040]
Age	0.009***	-0.025**	0.009***	-0.025**	0.009**	-0.024**	0.009**	-0.025**	0.013***	-0.037***
	[0.004]	[0.010]	[0.004]	[0.010]	[0.004]	[0.010]	[0.004]	[0.010]	[0.005]	[0.014]
RoA	0.752***	-2.173***	0.752***	-2.173***	0.749***	-2.162***	0.751***	-2.168***	0.883***	-2.658***
	[0.094]	[0.262]	[0.094]	[0.262]	[0.094]	[0.263]	[0.094]	[0.263]	[0.129]	[0.358]
Lev	0.058***	-0.168***	0.058***	-0.168***	0.057***	-0.166***	0.058***	-0.166***	0.066**	-0.198**
	[0.020]	[0.059]	[0.020]	[0.059]	[0.020]	[0.060]	[0.020]	[0.059]	[0.029]	[0.088]
Size	0.004***	-0.011**	0.004***	-0.011**	0.004***	-0.011***	0.004***	-0.011***	0.003	-0.008
	[0.001]	[0.004]	[0.001]	[0.004]	[0.001]	[0.004]	[0.001]	[0.004]	[0.002]	[0.007]
ForOps	-0.006	0.019	-0.006	0.019	-0.006	0.020	-0.006	0.020	-0.004	0.019
	[0.006]	[0.016]	[0.006]	[0.016]	[0.006]	[0.017]	[0.006]	[0.016]	[0.008]	[0.023]
BM	0.000***	-0.001***	0.000***	-0.001***	0.000***	-0.001***	0.000***	-0.001***	0.000*	-0.001*
	[0.000]	[0.001]	[0.000]	[0.001]	[0.000]	[0.001]	[0.000]	[0.001]	[0.000]	[0.001]
AggLoss	-0.033	0.107	-0.033	0.107	-0.033	0.107	-0.033	0.107	-0.011	0.056
	[0.028]	[0.079]	[0.028]	[0.079]	[0.028]	[0.079]	[0.028]	[0.079]	[0.028]	[0.082]
CFCnstrnt	-0.040*	0.087	-0.040*	0.087	-0.041*	0.090	-0.040*	0.087	-0.009	-0.004
	[0.022]	[0.059]	[0.022]	[0.059]	[0.022]	[0.059]	[0.022]	[0.059]	[0.035]	[0.100]
Intang	-0.047***	0.145***	-0.047***	0.145***	-0.047***	0.145***	-0.047***	0.145***	-0.065***	0.210***
	[0.012]	[0.035]	[0.012]	[0.036]	[0.012]	[0.035]	[0.012]	[0.035]	[0.019]	[0.058]
PPE	0.060***	-0.181***	0.059***	-0.181***	0.059***	-0.180***	0.059***	-0.181***	0.054***	-0.181***
	[0.012]	[0.035]	[0.012]	[0.035]	[0.012]	[0.035]	[0.012]	[0.035]	[0.016]	[0.047]
RnD	0.149**	-0.409**	0.149**	-0.409**	0.151**	-0.413**	0.148**	-0.408**	0.086	-0.320
	[0.064]	[0.183]	[0.064]	[0.183]	[0.063]	[0.179]	[0.064]	[0.182]	[0.085]	[0.242]
ADR	0.003	-0.021	0.003	-0.021	0.004	-0.027	0.004	-0.023	0.029	-0.088
	[0.019]	[0.060]	[0.019]	[0.060]	[0.019]	[0.061]	[0.019]	[0.060]	[0.021]	[0.070]
Intercept	-0.173	1.458***	-0.154***	1.456***	-0.156**	1.450***	-0.203*	1.577***	-0.112	1.323***
	[0.131]	[0.373]	[0.052]	[0.145]	[0.069]	[0.218]	[0.113]	[0.327]	[0.146]	[0.412]
Fixed Effects	C I Y	C I Y	C I Y	C I Y	C I Y	C I Y	C I Y	C I Y	C I Y	C I Y
Observations	42,714	42,714	42,714	42,714	42,714	42,714	42,714	42,714	26,966	26,966
Adjusted R-squared	0.080	0.078	0.080	0.078	0.080	0.078	0.080	0.078	0.086	0.087

This table presents OLS regression estimations of directional analyses of information opacity and tax avoidance using firm-level annual observations. The dependent variable of each model is labeled at the column head and includes either the cash effective tax rate spread or ratio (CETRSpr and CETRSca, respectively). Columns (5) and (6) report robustness results with a random selection of 11 countries as adopters (as opposed to the 11 countries selected per Table 6). Columns (7) and (8) report robustness results with a randomly selected year as the mandatory IFRS adoption year. Columns (9) and (10) report robustness results for tests that exclude the United States from the control sample. All variables are as defined in the Appendix. Robust standard errors clustered at both the firm and year level are reported in brackets below the coefficients. Additionally, country, industry, and year fixed effects are included in each model as indicated, though the coefficients are not reported. All continuous variables are winsorized at the 1 percent level. Significance levels are based upon two-sided t-tests and are indicated as follows: * $p<0.1$, ** $p<0.05$, *** $p<0.01$.

Table 8: IFRS Adoption, Information Opacity, and Tax Avoidance

Variables	(1) CETRSpr	(2) CETRSca	(3) CETRSpr
OScore	0.025***	-0.071***	0.028***
	[0.005]	[0.018]	[0.007]
PostAdopter	0.014	-0.053	
	[0.024]	[0.074]	
OScore*PostAdopter	-0.017***	0.051***	
	[0.005]	[0.020]	
PostIFRS			0.028***
			[0.010]
OScore*PostIFRS			-0.017***
			[0.002]
Big5	0.073**	-0.220*	0.074**
	[0.036]	[0.121]	[0.035]
Age	0.010	-0.020	0.010
	[0.016]	[0.045]	[0.016]
RoA	0.615***	-1.854***	0.612***
	[0.034]	[0.112]	[0.034]
Lev	0.004	-0.034	0.003
	[0.057]	[0.160]	[0.058]
Size	0.013**	-0.037***	0.012**
	[0.005]	[0.013]	[0.005]
ForOps	-0.002	0.012	-0.002
	[0.011]	[0.034]	[0.012]
BM	-0.000**	0.001*	-0.000**
	[0.000]	[0.001]	[0.000]
AggLoss	-0.108**	0.355**	-0.108**
	[0.049]	[0.149]	[0.048]
CFCnstrnt	-0.130**	0.333**	-0.132***
	[0.051]	[0.133]	[0.049]
Intang	0.017	-0.039	0.019
	[0.036]	[0.099]	[0.035]
PPE	0.009	-0.047	0.009
	[0.039]	[0.103]	[0.038]
RnD	-0.018	-0.069	-0.011
	[0.197]	[0.558]	[0.197]
ADR	-0.037	0.119	-0.044
	[0.052]	[0.178]	[0.051]
Intercept	-0.196***	1.624***	-0.199***
	[0.037]	[0.110]	[0.036]
Fixed Effects	C I Y	C I Y	C I Y
Observations	3,002	3,002	3,002
Adjusted R-squared	0.054	0.058	0.054

This table presents OLS regression estimations of the effect of information opacity on tax avoidance immediately before and after mandatory IFRS adoption using firm-level annual observations. The dependent variable of each model is labeled at the column head and includes either the cash effective tax rate spread or ratio (CETRSpr and CETRSca, respectively). All variables are as defined in the Appendix. Robust standard errors clustered at the firm and year level are reported in brackets below the coefficients. Additionally, country, industry, and year fixed effects are included in each model as indicated, though the coefficients are not reported. All continuous variables are winsorized at the 1 percent level. Significance levels are based upon two-sided t-tests and are indicated as follows: * p<0.1, ** p<0.05, *** p<0.01.

Table 9: Tax Avoidance and Insider Trading Enforcement as Shock to Information Opacity

Variables	(1) CETRSpr	(2) CETRSca	(3) ETRSpr	(4) ETRSca
IT Enforcement	-0.099***	0.293***	-0.036***	0.068**
	[0.037]	[0.108]	[0.013]	[0.034]
Big5	0.005	-0.010	-0.015**	0.025
	[0.010]	[0.029]	[0.006]	[0.016]
Age	0.009***	-0.025**	-0.001	0.003
	[0.004]	[0.010]	[0.002]	[0.006]
RoA	0.752***	-2.173***	-0.145***	0.400***
	[0.094]	[0.262]	[0.015]	[0.042]
Lev	0.058***	-0.168***	0.021**	-0.048*
	[0.020]	[0.060]	[0.011]	[0.028]
Size	0.004***	-0.011***	-0.004***	0.014***
	[0.001]	[0.004]	[0.001]	[0.003]
ForOps	-0.006	0.020	0.003	-0.005
	[0.006]	[0.016]	[0.004]	[0.012]
BM	0.000***	-0.001***	0.000*	-0.001**
	[0.000]	[0.001]	[0.000]	[0.000]
AggLoss	-0.033	0.107	0.170***	-0.476***
	[0.028]	[0.078]	[0.008]	[0.023]
CFCnstrnt	-0.040*	0.087	-0.045***	0.110**
	[0.022]	[0.059]	[0.017]	[0.045]
Intang	-0.048***	0.146***	-0.039***	0.102***
	[0.012]	[0.035]	[0.006]	[0.018]
PPE	0.059***	-0.181***	0.016**	-0.056***
	[0.012]	[0.035]	[0.007]	[0.018]
RnD	0.151**	-0.416**	0.140***	-0.313***
	[0.064]	[0.181]	[0.025]	[0.075]
ADR	0.004	-0.024	0.013	-0.015
	[0.020]	[0.062]	[0.009]	[0.027]
Intercept	-0.082	1.243***	0.174***	0.513***
	[0.051]	[0.141]	[0.035]	[0.102]
Fixed Effects	C I Y	C I Y	C I Y	C I Y
Observations	42,714	42,714	73,325	73,325
Adjusted R-squared	0.080	0.078	0.121	0.110

This table presents OLS regression estimations of directional analyses of information opacity, and tax avoidance using firm-level annual observations. The dependent variable of each model is labeled at the column head and includes either the cash effective tax rate spread or ratio (CETRSpr and CETRSca, respectively) in Columns (1) and (2) and the reported effective tax rate spread or ratio (ETRSpr and ETRSca, respectively) in Columns (3) and (4). All variables are as defined in the Appendix. Robust standard errors clustered at the firm and year level are reported in brackets below the coefficients. Additionally, country, industry, and year fixed effects are included in each model as indicated, though the coefficients are not reported. All continuous variables are winsorized at the 1 percent level. Significance levels are based upon two-sided t-tests and are indicated as follows: * $p<0.1$, ** $p<0.05$, *** $p<0.01$.

Table 10: Rent Extraction, Information Opacity, and Tax Avoidance

Variables	(1) CETRSpr	(2) CETRSca	(3) CETRSpr	(4) CETRSca
OScore	0.009**	-0.027**	0.007	-0.024*
	[0.005]	[0.013]	[0.005]	[0.013]
PBOpp_F	-0.034***	0.091***		
	[0.007]	[0.019]		
OScore*PBOpp_F	0.009*	-0.029**		
	[0.005]	[0.015]		
PBOpp_C			-0.009	0.023
			[0.021]	[0.060]
OScore*PBOpp_C			0.016**	-0.040*
			[0.007]	[0.022]
Big5	-0.001	0.005	0.036*	-0.084*
	[0.012]	[0.035]	[0.021]	[0.051]
Age	0.006	-0.015	0.006	-0.016
	[0.005]	[0.014]	[0.005]	[0.013]
RoA	0.749***	-2.199***	0.754***	-2.196***
	[0.176]	[0.499]	[0.176]	[0.494]
Lev	0.021	-0.062	0.039*	-0.106
	[0.024]	[0.071]	[0.022]	[0.066]
Size	0.007**	-0.021**	0.006***	-0.018**
	[0.003]	[0.009]	[0.002]	[0.007]
ForOps	-0.005	0.021	-0.004	0.020
	[0.009]	[0.026]	[0.009]	[0.024]
BM	0.000	-0.001	0.000	-0.001
	[0.000]	[0.001]	[0.000]	[0.001]
AggLoss	-0.079**	0.233**	-0.073**	0.218**
	[0.034]	[0.091]	[0.032]	[0.086]
CFCnstrnt	-0.062	0.116	-0.091	0.189
	[0.069]	[0.191]	[0.064]	[0.181]
Intang	-0.046***	0.138***	-0.003	0.029
	[0.017]	[0.050]	[0.018]	[0.051]
PPE	0.067***	-0.215***	0.074***	-0.233***
	[0.021]	[0.061]	[0.020]	[0.057]
RnD	0.117*	-0.408**	0.154**	-0.484***
	[0.066]	[0.180]	[0.064]	[0.177]
ADR	-0.058**	0.150**	-0.080***	0.196***
	[0.024]	[0.067]	[0.017]	[0.044]
Intercept	-0.179	1.575***	-0.131	1.432***
	[0.126]	[0.357]	[0.107]	[0.308]
Fixed Effects	C I Y	C I Y	I Y	I Y
Observations	15,788	15,788	16,473	16,473
Adjusted R-squared	0.098	0.093	0.088	0.085

This table presents OLS regression estimations of the opportunities for rent extraction, information opacity, and tax avoidance analysis using firm-level annual observations. The dependent variable of each model is labeled at the column head and includes either the cash effective tax rate spread or ratio (CETRSpr and CETRSca, respectively). All variables are as defined in the Appendix. Robust standard errors clustered at both the firm and year level are reported in brackets below the coefficients. Additionally, country, industry, and year fixed effects are included in each model as indicated (with country fixed effects omitted in some cases), though the coefficients are not reported. All continuous variables are winsorized at the 1 percent level. Significance levels are based upon two-sided t-tests and are indicated as follows: * $p<0.1$, ** $p<0.05$, *** $p<0.01$.

Table 11: Country-Level Information Opacity and Aggregate Tax Avoidance

	(1) CTaxRevGDP	(2) CTaxRevGDP	(3) CTaxRevGDP	(4) CTaxRevGDP	(5) CTaxRevGDP
Governance	0.021***				
	[0.007]				
Disclosure		0.029***			
		[0.007]			
MediaPen			0.026		
			[0.020]		
PostIFRS				0.305**	
				[0.147]	
Imput					0.779***
					[0.169]
CSTR	2.861**	0.332	1.679	-0.391	-2.513***
	[1.269]	[1.002]	[1.439]	[0.967]	[0.926]
BookTaxConf	1.418***	1.399***	1.120***	1.093***	0.500
	[0.302]	[0.302]	[0.316]	[0.345]	[0.365]
Worldwide	0.258*	0.655***	0.183	0.593***	0.638***
	[0.147]	[0.148]	[0.286]	[0.165]	[0.172]
EarnVol	-0.886**	-1.832***	-2.258***	-1.392***	-1.174***
	[0.399]	[0.324]	[0.336]	[0.358]	[0.345]
CivCom	-1.022***	-0.318	-0.415	-0.352	0.124
	[0.351]	[0.290]	[0.391]	[0.357]	[0.377]
AntiDirRights	-0.202**	-0.086	0.082	-0.048	0.064
	[0.092]	[0.074]	[0.074]	[0.098]	[0.102]
OwnCon	0.063	0.146	-0.216	0.215	0.612
	[0.468]	[0.457]	[0.417]	[0.574]	[0.607]
PBOpp_C	-0.543***	-0.481***	-0.190	-0.388***	-0.248
	[0.146]	[0.125]	[0.156]	[0.139]	[0.151]
Intercept	0.392	0.320	0.542	3.113***	3.573***
	[0.891]	[0.783]	[2.179]	[0.460]	[0.417]
Fixed Effects	Y	Y	Y		
Observations	248	248	199	248	248
Adjusted R-squared	0.413	0.440	0.587	0.266	0.328

This table presents OLS regression estimations of country-level information opacity measures and country-level corporate tax revenues. The dependent variable in all specifications is the corporate tax revenues collected by the jurisdiction for the year as a percentage of GDP for the year. All variables are as defined in the Appendix. Robust standard errors are reported in brackets below the coefficients. Additionally, year fixed effects are included in the first three models as indicated, though the coefficients are not reported. Significance levels are based upon two-sided t-tests and are indicated as follows: * $p<0.1$, ** $p<0.05$, *** $p<0.01$.

Table 12: Robustness of Firm-Level Information Opacity and Tax Avoidance

Variables	(1) CETRSca	(2) CETR2Spr	(3) CETR2Sca	(4) ETRSca	(5) ETR2Spr	(6) ETR2Sca	(7) CETR	(8) ETR	(9) CETR	(10) ETR
OScore	-0.037***	0.013***	-0.039***	-0.015*	0.005*	-0.015	-0.012***	-0.005*	-0.013***	-0.005*
	[0.008]	[0.003]	[0.008]	[0.009]	[0.003]	[0.009]	[0.003]	[0.003]	[0.003]	[0.003]
Big5	-0.004	0.002	-0.004	-0.005	-0.001	-0.003	-0.004	-0.002	-0.003	-0.002
	[0.035]	[0.012]	[0.035]	[0.024]	[0.010]	[0.025]	[0.011]	[0.008]	[0.011]	[0.009]
Age	-0.018	0.007	-0.019	-0.003	0.001	-0.002	-0.007	-0.001	-0.007	-0.001
	[0.013]	[0.005]	[0.013]	[0.009]	[0.003]	[0.010]	[0.005]	[0.003]	[0.005]	[0.003]
RoA	-2.177***	0.750***	-2.191***	0.632***	-0.218***	0.625***	-0.749***	0.217***	-0.752***	0.217***
	[0.475]	[0.171]	[0.483]	[0.112]	[0.035]	[0.112]	[0.168]	[0.035]	[0.169]	[0.035]
Lev	-0.057	0.019	-0.054	0.010	0.003	0.007	-0.020	-0.001	-0.020	-0.001
	[0.069]	[0.023]	[0.069]	[0.059]	[0.021]	[0.060]	[0.023]	[0.020]	[0.023]	[0.020]
Size	-0.023***	0.008***	-0.023***	0.008	-0.003	0.008	-0.008***	0.003	-0.008***	0.003
	[0.008]	[0.003]	[0.008]	[0.006]	[0.002]	[0.006]	[0.003]	[0.002]	[0.003]	[0.002]
ForOps	0.025	-0.007	0.026	-0.044**	0.018***	-0.045**	0.006	-0.017***	0.006	-0.017***
	[0.024]	[0.009]	[0.024]	[0.019]	[0.006]	[0.019]	[0.009]	[0.007]	[0.009]	[0.007]
BM	-0.001	0.000	-0.001	-0.001*	0.000*	-0.001*	-0.000	-0.000*	-0.000	-0.000*
	[0.001]	[0.000]	[0.001]	[0.001]	[0.000]	[0.001]	[0.000]	[0.000]	[0.000]	[0.000]
AggLoss	0.238***	-0.085**	0.248***	-0.475***	0.167***	-0.476***	0.085**	-0.167***	0.084**	-0.167***
	[0.088]	[0.034]	[0.091]	[0.044]	[0.015]	[0.045]	[0.033]	[0.015]	[0.034]	[0.015]
CFCnstrnt	0.105	-0.058	0.110	0.302***	-0.118***	0.303***	0.055	0.115***	0.055	0.115***
	[0.190]	[0.070]	[0.194]	[0.079]	[0.027]	[0.081]	[0.069]	[0.027]	[0.069]	[0.027]
Intang	0.123***	-0.040***	0.123***	0.092*	-0.031*	0.090*	0.042***	0.033**	0.041***	0.033**
	[0.047]	[0.016]	[0.047]	[0.052]	[0.017]	[0.052]	[0.016]	[0.017]	[0.015]	[0.017]
PPE	-0.227***	0.073***	-0.226***	-0.053	0.014	-0.054	-0.074***	-0.016	-0.074***	-0.015
	[0.059]	[0.021]	[0.060]	[0.039]	[0.014]	[0.039]	[0.021]	[0.013]	[0.021]	[0.013]
RnD	-0.412**	0.116*	-0.400**	-0.697***	0.261***	-0.699***	-0.126**	-0.265***	-0.125**	-0.264***
	[0.167]	[0.060]	[0.166]	[0.195]	[0.070]	[0.197]	[0.062]	[0.070]	[0.061]	[0.070]
ADR	0.139**	-0.053**	0.140**	-0.111***	0.040***	-0.113***	0.055***	-0.037***	0.054***	-0.038***
	[0.056]	[0.021]	[0.056]	[0.010]	[0.004]	[0.009]	[0.020]	[0.006]	[0.020]	[0.005]
CSTR									0.431**	0.053
									[0.188]	[0.083]
Intercept	1.654***	-0.215*	1.658***	0.441***	0.202***	0.443***	0.553***	0.141***	0.367	0.252
	[0.339]	[0.122]	[0.344]	[0.123]	[0.040]	[0.123]	[0.123]	[0.043]	[0.391]	[0.171]
Fixed Effects	C I Y	C I Y	C I Y	C I Y	C I Y	C I Y	C I Y	C I Y	C I Y	C I Y
Observations	16,473	16,471	16,471	19,174	19,174	19,174	16,494	19,195	16,473	19,174
Adjusted R-squared	0.093	0.096	0.092	0.096	0.099	0.095	0.115	0.118	0.115	0.118

This table presents OLS regression estimations of the information opacity and tax avoidance analysis using firm-level annual observations. The dependent variable of each model is labeled at the column head and includes: ratios of cash ETR and ETR with the country statutory rate, spreads and ratios calculated using alternative specifications of both the cash ETR and ETR, as well as the raw cash ETR and ETR. All variables are as defined in the Appendix. Robust standard errors clustered at both the firm and year level are reported in brackets below the coefficients. Additionally, country, industry, and year fixed effects are included in each model as indicated, though the coefficients are not reported. All continuous variables are winsorized at the 1 percent level. Significance levels are based upon two-sided t-tests and are indicated as follows: * p<0.1, ** p<0.05, *** p<0.01.

Table 13: Additional Robustness

	Lead/Lag Analysis		*Fama-Macbeth*	*3 Oscore*	*PCA*	*3 PCA*
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Variables	**CETRSpr**	**Lag CETRSpr**	**CETRSpr**	**CETRSpr**	**CETRSpr**	**CETRSpr**
Lag OScore	0.019***					
	[0.004]					
OScore		-0.002	0.016***			
		[0.004]	[0.004]			
OScoreAlt				0.012***		
				[0.004]		
PCOscore					0.016***	
					[0.004]	
PCOscoreAlt						0.018***
						[0.004]
Big5	-0.003	0.004	0.178***	0.010	0.003	0.009
	[0.009]	[0.009]	[0.038]	[0.014]	[0.012]	[0.014]
Age	0.013***	-0.011	0.007	0.005	0.007	0.005
	[0.005]	[0.007]	[0.005]	[0.004]	[0.004]	[0.004]
RoA	0.916***	0.003	1.009***	0.667***	0.681***	0.631***
	[0.164]	[0.036]	[0.211]	[0.108]	[0.161]	[0.106]
Lev	-0.004	0.013	0.101***	0.051***	0.020	0.053***
	[0.029]	[0.018]	[0.029]	[0.020]	[0.023]	[0.020]
Size	0.011***	0.000	0.014***	0.006***	0.007***	0.005***
	[0.003]	[0.002]	[0.003]	[0.002]	[0.003]	[0.002]
ForOps	-0.004	0.006	-0.028**	-0.001	-0.006	-0.001
	[0.009]	[0.010]	[0.012]	[0.006]	[0.009]	[0.006]
BM	0.000	0.001**	0.000	0.001***	0.000	0.001***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
AggLoss	-0.077***	-0.268***	0.001	-0.067**	-0.076**	-0.064**
	[0.029]	[0.058]	[0.029]	[0.028]	[0.033]	[0.028]
CFCnstrnt	-0.018	0.031	-0.024	-0.069*	-0.151**	-0.130***
	[0.066]	[0.030]	[0.077]	[0.039]	[0.075]	[0.040]
Intang	-0.009	-0.009	-0.060	-0.044***	-0.045***	-0.047***
	[0.024]	[0.015]	[0.046]	[0.012]	[0.015]	[0.012]
PPE	0.102***	0.085***	0.080***	0.059***	0.070***	0.058***
	[0.020]	[0.020]	[0.017]	[0.012]	[0.019]	[0.012]
RnD	0.047	0.316***	-0.247	0.137**	0.121**	0.137**
	[0.090]	[0.074]	[0.212]	[0.065]	[0.061]	[0.064]
ADR	-0.047**	-0.048*	-0.056	0.007	-0.055***	0.007
	[0.022]	[0.026]	[0.043]	[0.024]	[0.020]	[0.024]
Intercept	-0.416***	0.030	-0.356**	-0.188**	-0.095	-0.111
	[0.113]	[0.059]	[0.123]	[0.075]	[0.115]	[0.077]
Fixed Effects	C I Y	C I Y		C I Y	C I Y	C I Y
Observations	12,179	14,875	18,590	27,658	16,473	27,658
Adjusted R-squared	0.100	0.105	0.081	0.087	0.099	0.089

This table presents OLS regression estimations of the information opacity and tax avoidance analysis using firm-level annual observations. The dependent variable in all specifications except Column (2) is the cash effective tax rate spread (CETRSpr). For Column (2) the dependent variable is the lagged CETRSpr. All other variables are as defined in the Appendix. Columns (1) and (2) perform a lead-lag analysis, Column (3) presents the results for Fama-Macbeth (yearly cross-sectional) regressions, Column (4) excludes the Bid-Ask Spread from the calculation of OScore (with a new range of 0 to 3), Column (5) calculates OScore as a principal-component analysis of all four measures of opacity, and Column (6) calculated OScore using a principal-component anlaysis for only the three measures of opacity used in Column (4). Robust standard errors clustered at both the firm and year level are reported in brackets below the coefficients. Additionally, country, industry, and year fixed effects are included in each model as indicated, though the coefficients are not reported. All continuous variables are winsorized at the 1 percent level. Significance levels are based upon two-sided t-tests and are indicated as follows: * $p<0.1$, ** $p<0.05$, *** $p<0.01$.

Table 14: Firm-Level Excluding United States

Panel A: Cash ETR Spread

Variables	(1) CETRSpr	(2) CETRSpr	(3) CETRSpr	(4) CETRSpr	(5) CETRSpr
ForErr	0.040**				
	[0.020]				
ForDisp		0.085**			
		[0.039]			
DiscAcc			0.322***		
			[0.072]		
BidAskSpr				0.551**	
				[0.262]	
OScore					0.013***
					[0.003]
Big5	-0.013	-0.003	-0.016	-0.004	0.010
	[0.012]	[0.013]	[0.016]	[0.013]	[0.018]
Age	0.013**	0.008	0.014***	0.017***	0.013***
	[0.005]	[0.005]	[0.005]	[0.005]	[0.004]
RoA	0.874***	0.832***	0.753***	0.920***	0.847***
	[0.128]	[0.142]	[0.139]	[0.141]	[0.182]
Lev	0.064**	0.054*	0.060**	0.043	0.023
	[0.029]	[0.028]	[0.028]	[0.030]	[0.027]
Size	0.003	0.005	0.002	0.007***	0.008**
	[0.002]	[0.003]	[0.002]	[0.002]	[0.004]
ForOps	-0.005	-0.000	-0.006	-0.011	-0.008
	[0.009]	[0.009]	[0.009]	[0.009]	[0.011]
BM	0.000*	0.000	0.000**	0.000	-0.000
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
AggLoss	-0.017	-0.065**	0.013	-0.011	-0.057**
	[0.028]	[0.030]	[0.022]	[0.027]	[0.029]
CFCnstrnt	-0.010	0.007	-0.217***	0.003	-0.010
	[0.036]	[0.041]	[0.066]	[0.036]	[0.063]
Intang	-0.067***	-0.054***	-0.072***	-0.059***	-0.048**
	[0.020]	[0.019]	[0.017]	[0.022]	[0.020]
PPE	0.053***	0.053***	0.051***	0.059***	0.063***
	[0.017]	[0.015]	[0.014]	[0.019]	[0.021]
RnD	0.095	0.019	0.165**	0.097	0.095
	[0.084]	[0.086]	[0.082]	[0.076]	[0.071]
ADR	0.026	0.023	0.031	0.028	-0.063***
	[0.021]	[0.021]	[0.026]	[0.031]	[0.022]
Intercept	-0.108	-0.135	0.098	-0.274***	-0.277**
	[0.070]	[0.084]	[0.075]	[0.077]	[0.121]
Fixed Effects	C I Y	C I Y	C I Y	C I Y	C I Y
Observations	26,535	20,351	20,864	22,643	12,980
Adjusted R-squared	0.086	0.091	0.092	0.086	0.096

This table presents OLS regression estimations of the information opacity and tax avoidance analysis using firm-level annual observations including all countries except the United States of America. The dependent variable in all specifications is the cash effective tax rate spread (CETRSpr). All variables are as defined in the Appendix. Robust standard errors clustered at both the firm and year level are reported in brackets below the coefficients. Additionally, country, industry, and year fixed effects are included in each model as indicated, though the coefficients are not reported All continuous variables are winsorized at the 1 percent level. Significance levels are based upon two-sided t-tests and are indicated as follows: * p<0.1, ** p<0.05, *** p<0.01.

Table 14: Firm-Level Excluding United States (continued)

Panel B: ETR Spread

Variables	(1) ETRSpr	(2) ETRSpr	(3) ETRSpr	(4) ETRSpr	(5) ETRSpr
ForErr	0.045***				
	[0.007]				
ForDisp		0.067***			
		[0.017]			
DiscAcc			0.023		
			[0.019]		
BidAskSpr				0.197**	
				[0.086]	
OScore					0.004
					[0.003]
Big5	-0.006	-0.011**	-0.005	0.001	-0.006
	[0.004]	[0.005]	[0.009]	[0.004]	[0.012]
Age	0.001	-0.002	0.004	0.004*	0.001
	[0.002]	[0.002]	[0.003]	[0.002]	[0.004]
RoA	-0.146***	-0.179***	-0.167***	-0.137***	-0.217***
	[0.025]	[0.025]	[0.031]	[0.026]	[0.040]
Lev	0.009	0.010	0.011	0.013	0.015
	[0.008]	[0.011]	[0.015]	[0.011]	[0.021]
Size	-0.004***	-0.003**	-0.006***	-0.003***	-0.004*
	[0.001]	[0.001]	[0.001]	[0.001]	[0.002]
ForOps	0.002	0.004	0.008	0.001	0.010
	[0.005]	[0.005]	[0.006]	[0.006]	[0.007]
BM	0.000	0.000	0.000***	0.000	0.000
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
AggLoss	0.160***	0.152***	0.169***	0.168***	0.161***
	[0.010]	[0.015]	[0.010]	[0.012]	[0.017]
CFCnstrnt	-0.029	-0.029	-0.042**	-0.020	-0.094***
	[0.021]	[0.026]	[0.020]	[0.020]	[0.027]
Intang	-0.034***	-0.029*	-0.025*	-0.036***	-0.025
	[0.012]	[0.016]	[0.015]	[0.012]	[0.023]
PPE	0.023**	0.019**	0.025***	0.023***	0.021
	[0.009]	[0.009]	[0.008]	[0.008]	[0.014]
RnD	0.039	0.077*	0.035	0.025	0.108
	[0.034]	[0.045]	[0.041]	[0.036]	[0.068]
ADR	0.003	0.003	0.018	0.004	0.044***
	[0.008]	[0.010]	[0.015]	[0.013]	[0.010]
Intercept	0.127***	0.146***	0.170***	0.138***	0.192***
	[0.037]	[0.038]	[0.034]	[0.036]	[0.043]
Fixed Effects	C I Y	C I Y	C I Y	C I Y	C I Y
Observations	45,918	33,592	25,048	38,722	14,792
Adjusted R-squared	0.089	0.085	0.086	0.085	0.078

This table presents OLS regression estimations of the information opacity and tax avoidance analysis using firm-level annual observations including all countries except the United States of America. The dependent variable in all specifications is the effective tax rate spread (ETRSpr). All variables are as defined in the Appendix. Robust standard errors clustered at both the firm and year level are reported in brackets below the coefficients. Additionally, country, industry, and year fixed effects are included in each model as indicated, though the coefficients are not reported. All continuous variables are winsorized at the 1 percent level. Significance levels are based upon two-sided t-tests and are indicated as follows: * p<0.1, ** p<0.05, *** p<0.01.

Table 15: Corporate and Personal Statutory Tax Rates Surrounding IFRS Adoption

	Pre-IFRS Adoption Year CSTR	IFRS Adoption Year CSTR	Post-IFRS Adoption Year CSTR	Pre-IFRS Adoption Year PSTR	IFRS Adoption Year PSTR	Post-IFRS Adoption Year PSTR	IFRS Adoption Date
AUSTRALIA	30.00%	30.00%	30.00%	48.50%	48.50%	46.50%	12/31/2005
AUSTRIA	34.00%	25.00%	25.00%	25.00%	25.00%	25.00%	12/31/2005
BELGIUM	33.99%	33.99%	33.99%	15.00%	15.00%	15.00%	12/31/2005
CANADA	-	-	-	-	-	-	-
CHILE	-	-	-	-	-	-	-
DENMARK	30.00%	28.00%	28.00%	43.00%	43.00%	43.00%	12/31/2005
FINLAND	29.00%	26.00%	26.00%	29.00%	28.00%	28.00%	12/31/2005
FRANCE	35.43%	34.93%	34.43%	55.94%	56.30%	48.68%	12/31/2005
GERMANY	38.90%	38.90%	38.90%	47.48%	44.31%	44.30%	12/31/2005
GREECE	35.00%	32.00%	29.00%	0.00%	0.00%	0.00%	12/31/2005
HUNGARY	16.00%	16.00%	17.33%	35.00%	35.00%	35.00%	12/31/2005
IRELAND	12.50%	12.50%	12.50%	42.00%	42.00%	42.00%	12/31/2005
ISRAEL	29.00%	27.00%	26.00%	25.00%	25.00%	25.00%	1/1/2008
ITALY	33.00%	33.00%	33.00%	12.50%	12.50%	12.50%	12/31/2005
JAPAN	-	-	-	-	-	-	-
LUXEMBOURG	-	-	-	-	-	-	-
MEXICO	-	-	-	-	-	-	-
NETHERLANDS	34.50%	31.50%	29.60%	25.00%	25.00%	25.00%	12/31/2005
NEW ZEALAND	33.00%	33.00%	33.00%	39.00%	39.00%	39.00%	12/31/2005
NORWAY	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	12/31/2005
POLAND	19.00%	19.00%	19.00%	19.00%	19.00%	19.00%	12/31/2005
PORTUGAL	27.50%	27.50%	27.50%	40.00%	40.00%	20.00%	12/31/2005
SOUTH KOREA	-	-	-	-	-	-	-
SPAIN	35.00%	35.00%	35.00%	45.00%	45.00%	45.00%	12/31/2005
SWEDEN	28.00%	28.00%	28.00%	30.00%	30.00%	30.00%	12/31/2005
SWITZERLAND	24.10%	24.10%	21.32%	40.36%	40.36%	40.36%	12/31/2005
TURKEY	-	-	-	-	-	-	-
UNITED KINGDOM	30.00%	30.00%	30.00%	32.50%	32.50%	32.50%	12/31/2005
UNITED STATES	-	-	-	-	-	-	-

The table shows both the corporate statutory tax rate (CSTR) and the personal statutory tax rate (PSTR) for the three years surrounding the adoption of IFRS for those countries which adopted IFRS.